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# Using The Social Ecological Model To Assess The Correlates Of Unprotected Sex Among African American Emerging Adults

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# USING THE SOCIAL ECOLOGICAL MODEL TO ASSESS THE CORRELATES OF UNPROTECTED SEX AMONG AFRICAN AMERICAN EMERGING ADULTS

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# USING THE SOCIAL ECOLOGICAL MODEL TO ASSESS THE CORRELATES OF UNPROTECTED SEX AMONG AFRICAN AMERICAN EMERGING ADULTS

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DEVELOPMENTAL PSYCHOLOGY

ABSTRACT

**Background:** The Centers for Disease Control and Prevention (CDC) reported that HIV diagnoses for Black/African American men and women are 8x and 15x higher than white individuals, respectively. While the social determinants of health largely influence HIV transmission rates, reducing risky behaviors can lower the risk for HIV. This current study used the Social Ecological Model to investigate correlates of unprotected sex. **Methods:** Participants were recruited through respondent-driven sampling. Participant's demographics (age, gender, years of education, financial difficulty) and norms and peer influences were assessed at baseline interviews. The dependent variable (unprotected sexual events) was assessed by using the Timeline Followback interview. **Analyses:** This study utilized baseline, cross-sectional data from the CH-II study for secondary data analyses. Hypotheses were assessed by using a multinomial logistic regression with the percentage of unprotected sexual events put into three categories (never, sometimes, and always). Never was the reference group. **Results:** The total sample included 228 Black/African American emerging adults (mean age= 21.54; 56.6% female). With regards to sometimes engaging in unprotected sex, the age predictor is negative and significant (B= -.232, p =.044). The perceived unprotected sex of peers predictor is positive and significant (B =.449, p = .010). The perceived lifetime sexual partners of

peers predictor is positive and significant; (B =.109, p =.003). The total number of sexual events predictor (inverse of the variable was used in the model) is negative and significant; (B = -4.477, p =.010). With regards to always engaging in unprotected sex, the substance use predictor was positive and significant (B = .366, p = .009). The perceived unprotected sex of peers predictor is positive and significant (B =.621, p <.001). The perceived lifetime sexual partners of peers predictor is positive and significant; (B =.076, p =.037). The total number of sexual events predictor (inverse) is negative and significant; (B= -5.232, p =.003). **Conclusion:** Potential interventions should investigate how to mitigate consistent unprotected sex related challenges by creating more modern interventions, and by conducting research to shape policies that are related to STI and HIV prevention, treatment, and care.

*Keywords: HIV, STI, Black/African American, Heterosexual, Unprotected Sex, Social Ecological Model*

# DEDICATION

This thesis is first and foremost dedicated to Larry Thornton, who has been there for me in a substantial amount of ways. Larry has been my biggest inspiration and supporter. He is an amazing human being, and I am blessed beyond belief to have received his help. It was Larry's fearless strength, guidance, and tenacity that has gotten me this far in life. I hope that he continues to remain by my side, and see me graduate from the entire doctoral program. I hope that I have made him proud. I also dedicate this thesis to my sisters Latifah, La'nee Gray and Tinasha Gray, my aunts Jackie, Joy, and Janice, my cousin Shakthar Gilbert, my godson Lakenn, my three nephews Caleb, Charlie, and Caison, and my three nieces Cassie, Caissley, and Charrell. Talking to these family members really encourage me to move on and to stay focus. Lastly, I dedicate my thesis to every black and brown girl who lives in underserved and disavantages areas in Louisiana and Alabama, young people who have been in foster care and/or state custody, and young people who believe that there is no hope for a future. I hope they dream of accomplishing something great, and then set out to make it happen. They should never give up, no matter how tough times get. The light is just over the horizon, and we all shall win.

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CHAPTER 1

# INTRODUCTION

On a global scale, more than one million people are suffering from sexually transmitted infections (STIs); about 60% of those affected are young Black/African American (B/AA) individuals (Chawla et al., 2019). When compared to other countries, the prevalence of STIs and human immunodeficiency virus (HIV) is three times higher in the United States (US). This is a serious public health concern, and several steps must be taken to close this health disparity gap (Laurencin et al., 2018). The risk for contracting a STI or HIV is unevenly distributed among the B/AA population. Despite the best efforts of public health practitioners, B/AA emerging adults are still at a high risk for contracting a STI and HIV. Assessing sexual behaviors, testing practices, social constructs and barriers, and condom use among B/AA emerging adults must be prioritized.

The high numbers and percentages of STI and HIV rates among this population is potentially due to engagement in sexual encounters without the use of a condom, experiencing a variety of mental health issues, and having a lack of finances. In addition, researchers have found that B/AA emerging adults are experiencing a knowledge gap of sexual health literacy regarding STIs, perhaps, due to a lack of educational knowledge and sex education programming (Painter et al., 2012). Previous literature indicated the odds of an STI diagnosis were 73% lower among participants with a college degree or greater compared to participants who had not completed high school (Painter et al., 2012). Education strongly predicts condom use during sexual intercourse.

Furthermore, B/AA are lacking STI awareness, which is possibly influenced by social, structural, and psychological barriers (Arnett et al., 2016). Moreover, B/AA emerging adults often do not have access to a primary care physician (Arnett et al., 2016). Because of high STI and HIV rates, researchers sought to understand how certain individuals of this population define risky sexual behaviors and safe sex. Fourteen B/AA women ages 18-29 were enrolled in a study, and results indicated that the participants' definitions of the safe sex and risky sexual behaviors were consistently influenced by sex partner type, such as monogamy or friends with benefits. Participants did not use condoms if they were in a monogamy relationship (Anaebere et al, 2013). Having one partner or a main partner strongly predicts condom use during sexual intercourse.

***Racial Disparities among Black/African Americans***

Racial disparities in STI prevalence have caused devastating health consequences among BAA emerging adults. Research consistently indicates that this population are more likely to be diagnosed with a variety of STIs, such as, syphilis, chlamydia, and gonorrhea (Painter et al., 2012; Tillerson, 2008). Other studies have shown that B/AA are more than 20 times likely than Whites and more than 4 times likely than Hispanics to contract a STI and HIV (Tillerson, 2008). A similar study concluded that B/AA women in the United Sates are disproportionately affected by HIV/AIDS. In 2020, this population women comprised 54% of HIV diagnoses. This diagnosis rate is over 4 times that among Hispanic/Latina women and almost 11 times that among White women (Vitsupakorn et al., 2023). Research has also found an association that links B/AA to having multiple sex partners, engaging in substance use, and having higher levels of STIs due to unprotected sex (Oser, 2017; Jackson et al., 2015). In addition, B/AA are less

likely to utilize health services, and less likely to use a condom during sexual intercourse, which further increases the potential consequences of STIs and HIV (Taggart et al., 2020).

### *Perceptions of Condom Use*

Condom use during any type of sexual intercourse has been deemed the most protective measure against contracting a STI and/or HIV (Javier et al., 2018). So, why are people inconsistently using them or not using them at all? Some B/AA have negative perceptions toward condom use, so they are less likely to use them during sexual encounters. Some reported being in a serious and long-term relationship, so having protected vaginal and oral sex is viewed as unnecessary (Crosby et al., 2000; Crosby et al., 2013). Others have reported that neither them nor or their partner have never tested positive for a STI or HIV, so they do not feel that they protection (Harawa et al., 2006). Lastly, women reported leaving the decisions of sexual encounters and utilizing protection during vaginal sex to their partners (Crosby et al., 2013). Other studies have shown that heterosexual B/AA did not use a condom during their last anal sexual encounter and that anal sex among this population is very common (Hess et al., 2016). Several individuals deem oral sex as "not real sex," therefore, they are less likely to use a condom when performing oral sex (Crosby et al., 2000).

Due to the perceptions about condom use, researchers and public health practitioners must focus on decreasing barriers and negative perceptions that are inhibiting B/AA from forming a sense and commitment of self-efficacy regarding their sexual health and condom use (Sayles et al., 2006). This could possibly be achieved by helping them recognize the relationship between their emotions and their behaviors,

which could also help them regulate between positive and negative emotions during moments of sexual decision-making. This is extremely important because to reach this population, a new approach is needed. Most researchers have approached the concerning issues of unprotected sex by utilizing The Social Ecological Model (SEM). SEM plays a vital role in research, and helped several researchers and public health practitioners to understand why BAA emerging adults are engaging in sexual intercourse with low rates of condoms (Khuzwayo et al., 2018). This model is very important.

### *The Social Ecological Model*

The Social Ecological Model (SEM; Figure 1) created by Urie Bronfenbrenner considers an individual's social factors, environment influences, surrounding organizations, beliefs, and values (Bronfenbrenner, 1979; Bronfenbrenner, 1986; Bronfenbrenner, 1999). It also helps public health practitioners and researchers understand the dynamic interrelations among an individual's personal and environmental factors (Khuzwayo et al., 2018). There are several levels within the SEM: individual, interpersonal, community, organizational, and policy, and each level encompasses something unique to the individual. An ecological approach to addressing predictors of unprotected sex among B/AA is needed because contracting STI and HIV is still a significant public health challenge and significant health disparities exist.

Research has consistently shown a positive relationship between high-risk sexual practices, such as, unprotected sex, multiple sex partners, the exchange of sex for drugs and money, and engaging in substance use prior to sexual intercourse; particularly among B/AA emerging adults (Hong et al., 2015). Several previous articles focused on individual level-based predictors, but interpersonal level-based factors are also important

to consider when examining unprotected sex among B/AA emerging adults. Understanding these predictors will give researchers an idea of how they relate and contribute to unprotected sex among B/AA emerging adults.

This current study will utilize the individual and interpersonal levels from the SEM. The individual level focuses on self, such as, identities, behaviors, age, attitudes, beliefs, and values, etc. The interpersonal level focuses on social influences from a partner, peers, friends, family, and norms within social networks, etc. B/AA emerging adults are being diagnosed with HIV and STIs at a higher rate. Even when this population is well informed about the risks of unprotected sex and risky sexual behaviors, they still engage in it (Laurencin et al., 2018; Sales et al., 2014). Utilizing the SEM for this current study and for the B/AA population is important because it demonstrates the importance of investigating every level, it emphasizes the interaction and integration between an individual's personal, behavioral, social, and environmental factors, and it allows researchers to better understand sexual health disparities among B/AA emerging adults. Individual and biological factors alone are insufficient to explain the sexual health disparities and decisions of sexual behaviors among the B/AA population. Researchers must dive into the socio-cultural, interpersonal, and community disadvantages as well (Banks et al., 2020; Vitsupakorn et al., 2023). Investigating sexual behavioral decisions and disparities at higher levels of the SEM is critical.

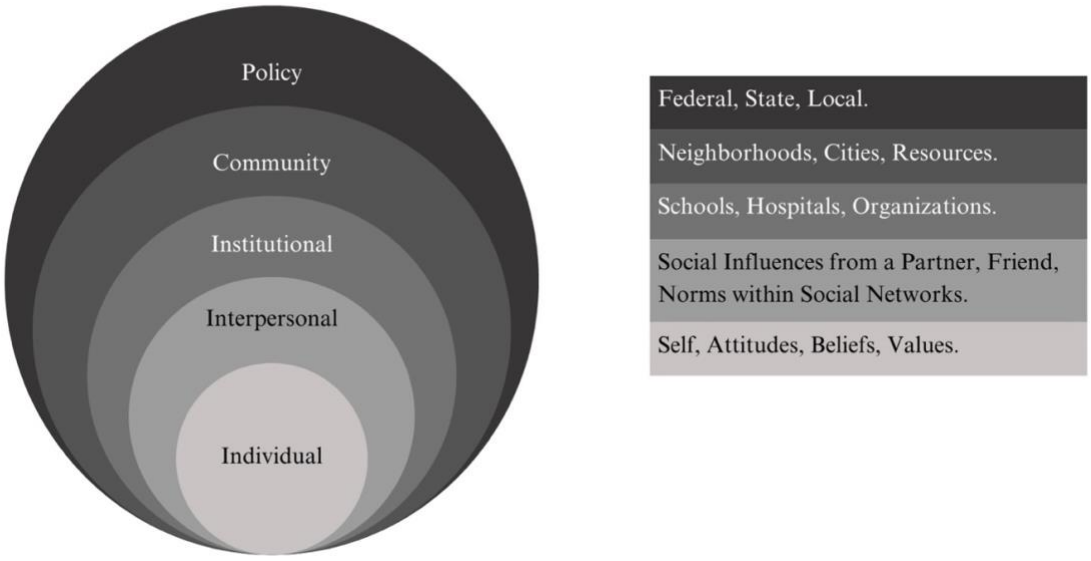


**Figure 1: The Social Ecological Model**

CHAPTER 2

# PREVIOUS LITERATURE

Relevant background literature was identified using multiple resources including PubMed, University of Alabama at Birmingham (UAB) libraries, Google Scholar, Alabama Virtual Library (AVL), National Library of Medicine (NIH and National Center for Biotechnology Information), The Journal of Medical Internet Research (JMIR) Publications (Advancing Digital Health and Open Science) and Web of Science. Articles were selected by using key words/phrases including condom usage, unprotected sex, risky sexual behaviors, African Americans, Social Ecological Model, emerging adults, income, and substance use. In PubMed, keywords/phrases such as, (income OR "young adults") and (income OR sexual health) were used. Citation tracing and reviewing articles that were published since the year 2000 also played a role in selection process. Over 60 articles that were closely related to the correlates of sexual health (STI/HIV), substance use, unprotected sex, among B/AA emerging adults were chosen for the previous literature section of this current study.

## Individual Level Predictors for Unprotected Sexual Events

### *Age*

Age has been deemed an important individual level predictor (ILP) of unprotected sex among the Black/African American (B/AA) population. Researchers examined age and unprotected sex among sexually active B/AA women ages 17-25 from disadvantaged neighborhoods in the Southern states. Results indicated that compared to younger

participants, higher levels of unprotected sex were reported among the older participants ages 21-25 (Swartzendruber et al., 2019). In another study, researchers also gathered information and data on B/AA male participants ages 18-24 living in disadvantaged/urban neighborhoods in Georgia. The participants shared their past and current experiences with unprotected sex during sexual intercourse. Similarly, results higher levels of unprotected sex were reported among the older participants ages 21-24. Henry Akintobi et al., 2016). The current study is linked to previous literature because age is also being studied as a significant individual level predictor for unprotected sex among participants from high at-risk/urban areas.

***Substance Use***

Another important ILP of unprotected sex is substance use (drugs and alcohol). Substance use has been known to play a role in several risky sexual behaviors, unprotected sex, and contracting a STI (Oser, 2017). Researchers examined the association between substance use and unprotected sex among sexually active B/AA women from disadvantaged neighborhoods in the Southern states. The participants also shared information about their risky sexual practices. Results indicated that increased alcohol and marijuana use were associated with sexual intercourse with multiple sex partners and an increase of unprotected sex (Swartzendruber et al., 2019). Another study examined the sexual risk behaviors and substance use behaviors among B/AA males. Results indicated that participants who reported using drugs or alcohol prior to sex had an increased likelihood for unprotected sex, and participants who reported injecting drugs prior to sex also had an increased likelihood for unprotected sex (Operario et al., 2011). Substance use has a huge impact on sexual behaviors.

Jackson et al. (2015) conducted a study to determine how substance use is related to risky sexual behaviors, unprotected sex, and STIs among B/AA women. Results indicated that participants who reported engaging in substance use were also engaging in unprotected sex and more likely tested positive for at least one STI. Results also indicated that residing in high-risk urban areas, engaging in higher levels of substance use prior to sex, (marijuana, ecstasy, and ≥3 drinks in 1 sitting) are predictors of unprotected sex and contracting STIs (Jackson et al., 2015). The study by Jackson et al. (2015) is similar to previous literature.

Lastly, 393 females were assessed on alcohol use, sociodemographic, STIs, along with risky sexual behaviors, such as engaging in unprotected sex, and engaging in sex while under the influence of substance use (Seth et al., 2011). Results from this study indicated that higher levels of alcohol use predicted positive STI results, inconsistent condom use, high sex seeking, and having multiple sexual partners (Seth et al., 2011). Being under the influence of drugs and/or alcohol can weaken a person's mindset and cognitive state. Individuals tend to have poor judgement of their surroundings and situations when under the influence of drugs or alcohol. Several studies have indicated that substance use can decrease an individual's skill to negotiate or communicate about safe sex practices (Chawla et al., 2019). Similar to previous literature, the current study will examine substance use as a predictor of unprotected sex.

### *Financial Difficulty*

In lower-income communities the need to purchase food and pay for bills are prioritized over purchasing condoms or any other contraception method (Whittle et al., 2015). To better understand how financial difficulty is correlated with unprotected sex

and risky sexual practices, researchers conducted focus groups in a low-income housing project in Houston, TX. Thirty low-income earning B/AA joined the focus group to share their perceptions of HIV/AIDS in their community, along with situations that have placed them at risk for contracting HIV/AIDS. The results indicated that the participants perceive HIV/AIDS as a threat to their community, and shared that they have placed themselves at risk for contracting HIV/AIDS by engaging in unsafe sex practices (unprotected sex, partaking in substance use, and having a lack of HIV knowledge). Participants also stated that their lack of income and financial means to purchase condoms is a huge barrier to safe sex practice, and reported that they spend their money on food, shelter, and bills (Essien et al., 2005). When living in a low-income community, food and shelter are prioritized.

***Sex***

Research has indicated that condom use during sexual intercourse differ among males and females. Researchers examined the sexual behavior of young B/AA ages 15-24, the spread of HIV, and unprotected sex. Females who associated condom use with lack of trust were more likely to engage in unprotected sex or use condoms inconsistently. Males who reported having multiple sex partners and believed that condoms are safe were less likely to engage in unprotected sex (Prata et al., 2005). In another study, researchers examined the association of unprotected vaginal and unprotected oral sex (UVS/UOS) among 522 females, and results indicated that females reported greater UVS and UOS if they were in steady/long relationships and spent more time with their partner (Crosby et al, 2000). Haley et al. (2013) conducted a study to determine the predictive value of personal, environmental, and behavioral factors for

condom use among 613 individuals, and the findings indicated that predictors for condom use included, having multiple sex partners, and being a male. Lastly, in a study conducted by Szucs et al. (2020), using condoms as the primary method for STI and HIV prevention reported by male participants was 49.4% higher than female participants who reported condom use during sexual intercourse.

## Interpersonal Level Predictors for Unprotected Sexual Events

### *Main Partner*

Main partners are an important interpersonal level predictor when examining if individuals are engaging in unprotected sex. Researchers presented findings after examining the influence of motivations and relationship factors on condom use behaviors with main partners among B/AA males and women ages 15-25. The findings resulted that participants reported engaging in unprotected sex with their main partner, relationship with a main partner predicted inconsistent condom use, and the level of unprotected sex was substantially high among participants with a main partner (Hock-Long et al., 2013; Hicks et al., 2017). Researchers focused on the main partner predictor among B/AA participants. After participants reported having a main partner and their sexual behaviors with a main partner, results indicated that participants reported engaging in Unprotected Insertive Anal Intercourse (UIAI). Results also indicated that participants with main partners were more likely than those without main partners to have had UIAI (Hart et al., 2004).

Similar to previous literature, researchers examined the main partner predictor with unprotected sex among B/AA participants. Participants who reported having a main partner, also reported engaging in unprotected sex with their main partner (Hicks et al.,

2017). A study enrolled both male and female participants to share their experiences with unprotected sex with a main partner. Thirty-four percent of individuals without a main partner were more likely to use condoms as opposed to those with a main partner. Also, individuals with a main partner who engaged in substance use and anal sex reported inconsistent condom use (Nehl et al., 2016).

### *HIV/STI and/or Condom Use Conversations*

Effective communication between partners has been positively correlated with condom use and safer sexual practices (Widman et al., 2013). Researchers investigated the association between intentions to use condoms, sexual health conversations, and unprotected sex among B/AA men and women ages 18-45. Results indicated that individuals who communicate or intend to communicate with their sexual partners about condoms and sexual health topics (e.g., HIV/STDs, sexual histories) were more likely to use condoms than individuals who did not communicate (Widman et al., 2013; Bond et al., 2018).

Researchers wanted to have a better understand of the correlates of unprotected oral sex (UOS) and unprotected vaginal intercourse (UVI) among B/AA female participants. Participants provided information on demographics, sexual communication self-efficacy (SCSE), sexual communication frequency, UOS, and UVI. Results concluded that participants who reported having low SCSE were almost 3 times more likely to engage in UOS and UVI when compared to those who reported having high SCSE. Participants also reported being afraid of condom negotiation, which showed that they were 3 times more likely to engage in UVI (Crosby et al., 2013). Having high SCSE is important when trying to communicate and STI/HIV, and condom use.

### *Peer Norms*

Research has consistently indicated that peer norms play a unique role in unprotected sex and risky sexual behaviors among B/AA (Hart et al., 2004). Peer norms have also been named as an important influencer on an individual's sex related decisions. One study indicated that peer norms were linked to an increased likelihood of unprotected insertive anal intercourse (UIAI). If participants reported perceiving that their peers or friends are engaging in UIAI, then the participants were also engaging in UIAI (Hart et al., 2004). Researchers stated that there should be ways to improve peer norms and condom use in black communities by hosting more interventions for family and friends.

Previous literature examined associations of risky peer norms and unprotected sex among B/AA females. Results indicated that a greater perception of risky peer norms was associated with a higher risk of engaging in unprotected sex under the influence of alcohol or drugs (Viosin et al., 2013). Therefore, if the participants reported that their peers were engaging in unprotected sex under the influence of alcohol or drugs, then the participants were more likely to engage in unprotected sex while under the influence of alcohol and drugs (Viosin et al., 2013). These results further indicate that peer norms have an important influence of sexual behaviors.

CHAPTER 3

# CURRENT STUDY

Prior research focused on oral and vaginal sex independently or together, and most studies tend to overlook anal sex among the heterosexual population. Heterosexual anal intercourse (HAI) is a very common behavior, and it results in a higher risk of HIV transmission when compared to vaginal and oral sex (Hess et al., 2016). In addition, about 30% of women and 35% of men reported engaging in HAI (Hess et al., 2016). Therefore, this current study will focus on examining the correlates of unprotected anal, oral, and vaginal sex among heterosexual B/AA emerging adults residing in Birmingham, Alabama. The "emerging adult" development is a crucial life period between the ages of 18-25 years old. This age group has an increased number of opportunities, freedom, and exploration. After reviewing previous literature, it is apparent that new approaches are needed to help guide B/AA emerging adults to safe sex practices. One method is to reduce their engagement in unprotected sex. This current study will utilize two levels from the SEM to assess the correlates of unprotected sex among B/AA emerging adults.

**Aim 1**: To assess Individual level correlates of unprotected sex among B/AA emerging adults from the SEM.

- **Hypothesis 1A:** Older participants will be associated with being more likely to engage in unprotected sexual events (anal, oral, vaginal sex).
- **Hypothesis 1B:** Female sex will be associated with being more likely to engage in unprotected sexual events.
- **Hypothesis 1C:** Higher levels of financial difficulty will be associated with being more likely to engage in unprotected sexual events.

- **Hypothesis 1D:** Engaging in higher levels of substance use will be associated with being more likely to engage in unprotected sexual events.

**Aim 2:** To assess Interpersonal level correlates of unprotected sex among B/AA emerging adults from the SEM.

- **Hypothesis 2A:** Engaging in higher levels of HIV/STI and/or condom use conversations will be associated with being less likely to engage in unprotected sexual events.

- **Hypothesis 2B:** Participants who report having a main partner will be associated with being more likely to engage in unprotected sexual events.

- **Hypothesis 2C:** Higher numbers of perceived sexual partners of peers (same age and friends) will be associated with being more likely to engaged in unprotected sexual events by the participant.

- **Hypothesis 2D:** Higher levels of perceived unprotected sex of peers will be associated with being more likely to engage in unprotected sexual events by the participant.

CHAPTER 4

# METHODS

## *City Health II Study*

This current study utilized baseline, cross-sectional data from the City Health (CH-II) study for secondary data analyses (Davies et al., 2020) CH-II is a cluster-randomized controlled trial that focused on reducing risky HIV-related behaviors among B/AA emerging adults living in disadvantaged and urban neighborhoods in the Birmingham, AL area. The purpose of the CH-II study was to test and evaluate the efficacy of a peer-driven entertainment education (EE) intervention compared to an attention-control intervention.

CH-II and this current study were reviewed and approved by the University of Alabama at Birmingham (UAB) Institutional Review Board (IRB). Individuals enrolled at baseline and provided informed consent. Primary data were collected through several interviews and questionnaires and were completed with a research interviewer. Data for CH-II are stored on encrypted password protected computers and software that are only accessible by research staff. Therefore, this current study used de-identified data.

## *Recruitment*

Participants for the CH-II study were recruited through a respondent-driven sampling (RDS); a variant of snowball sampling. For RDS, respondents are selected from a social network of existing members of the sample (McCreesh et al., 2013; Heckathorn, 2014; Tucker et al., 2016). To initiate recruitment, the CH-II staff selected “seeds” or

initial study participants from the target population and invited them to recruit up to three peers from their social network. For the "seed" participants, who initiated study recruitment, additional criteria included current residence in one of eight urban zip codes, which was shown to be at higher risk for adverse outcomes. For additional details on the CH-II study, see manuscript by Davies and associates (Davies et al., 2020).

***Participants***

Participant demographics including age, gender, years of education, and financial difficulty were assessed only at the baseline assessment, while data on norms and peer influences were collected at baseline, three, and six-month follow-up. The goal of CH-II was to inform and to help engage B/AA emerging adults through entertainment education (EE), along with other strategies for increasing their optimal sexual health behaviors. The inclusion criteria for the study were being 18-25 years of age, self-identification as B/AA, having regular access to the internet, having engaged in sexual intercourse at least once in their lives, and current residence in one of eight urban zip codes shown to be at higher risk for adverse outcomes. Exclusion criteria for the study included anyone planning to move out of the area within the six-month intervention period, being outside of the age range, having fewer than 10 people in social networks, not being in the target racial group, and not residing in target zip codes. There was a total of 330 participants in the CH-II study. Due to filtering out participants with missing data and participants who were currently celibate, the sample for this current study included 228 B/AA emerging adults (mean age= 21.54; 56.6% female).

## MEASURES

### *Timeline Followback Assessment (TLFB) for Condom Use and Sexual Events*

TLFB was created to assess an individual's alcohol intake (Sobell and Sobell, 1979; Sobell and Sobell, 1992; Sobell and Sobell, 1996). This method has been used to evaluate substance use across diverse populations, and it has been proven to be the most reliable and psychometrically accurate self-report measure of drinking and engaging in substance use (Sobell and Sobell, 1979; Robinson et al., 2014; DePesa et al., 2015). The TLFB has also been used to assess the prevalence of risky behaviors that could lead to HIV and STIs, and it has been proven reliable for reporting risky sexual behaviors (Carey et al., 2001). During the CH-II study, the interviewer presented the participants with a calendar, which was marked with the participant's past and present assessment dates, holidays, birthdays, and salient events. The participants were told that the calendar would help them to remember their sexual practices and social events. As the participants identified special dates, the interviewer would mark the calendar. Participants also provided initials and genders of their partners.

Participants were told to work from the beginning with the most recent event and then to work backwards. The interviewer also wanted to know the participant's sexual type (anal, oral, and/or vaginal), type of protection (if any), time of day, was alcohol involved, was there a discussion about safe sex/HIV/STI before sex, and was money involved before or after sex. All information was recorded on the calendar by the interviewer. The assessment collected sexual behavior data for the 3 months prior to the date of the appointment. This current study analyzed unprotected anal, oral, and vaginal sexual events for the 3 months prior to baseline assessment. The questions pertaining to

type of sex and condom use are: Vaginal sex? 1. Yes condom; 0. No condom; *and* 777. Does not apply-Did not have vaginal sex. Anal sex- receptive 1. Yes condom*;* 0. No condom, and 777. Does not apply- Did not have receptive anal sex. Anal sex- insertive 1. Yes condom*;* 0. No condom, and 777. Does not apply- Did not have insertive anal sex. Oral sex-give 1. Yes condom; 0. No condom, *and* 777. Does not apply- Did not give oral sex. Oral sex-receive 1. Yes condom; 0. No condom, and 777. Does not apply- Did not receive oral sex.

The total number of sexual events was summed and utilized as a covariate in the analyses. The percent of unprotected sexual events was calculated by dividing the number of unprotected sexual events by the total number of sexual events and multiplying by 100 to convert to a percentage. The percentages were then put into three groups that represent engaging in unprotected sex at baseline: (1= Never, 2= Sometimes, 3= Always). This categorical variable was utilized as the primary dependent variable of interest.

***Demographics***

Age, gender, education, and financial difficulty were assessed at baseline. Age (18-25) was measured as a continuous variable, and participants were asked, their date of birth in the MM/DD/YYYY format. Gender was measured a categorical variable. Participants were asked "What is your gender?" Gender was coded on a scale of 1-4. (1= Male; 2= Female; 3= Transgender: I was born a male, but currently identify as female; 4= Transgender: I was born a female, but currently identify as male). Two participants reported being a transgender female, so they were included in the female category. Gender was recoded to 0= male and 1= female. Education was assessed by highest grade

or level of education completed. 0-11 = grade completed, 12 = high school diploma, 14 = some college, 16 = bachelor's degree, 17 = some master's or doctoral courses, 18 = master's degree; 20 = MD or PhD. Financial Difficulty is a categorical variable, and was assessed by asking, "Without giving exact dollars, how would you describe your HOUSEHOLD's financial situation right now?" Responses were coded as: 1= Enough money for "extras"; 2 = Enough to pay bills without cutting back, but no "extras"; 3 = Enough to pay bills but have had to cut back; 4= Not enough to pay some bills, no matter how hard you try.

***World Health Organization Alcohol, Smoking and Substance Involvement Screening Test: (WHO_ASSIST) Questionnaire***

WHO_ASSIST was developed to detect and identify substance use and substance use disorders (WHO ASSIST, 2002). Since its development, it has been both valid and reliable in identifying substance use among individuals who engage in several substances (Ali et al., 2002; Humeniuk et al., 2012; McRee et al., 2018). For the CH-II study, participants were asked about their experiences of using various substances across their lifetime. These substances could be smoked, swallowed, snorted, inhaled, injected, or taken in the form of pills. Medications that were used as prescribed by a doctor were not recorded.

Participants were asked, "Which of the following statements is true?" The statements were coded, 1= I have used at least one of the following substances at least once in my life: tobacco, alcohol, marijuana, cocaine, amphetamines, inhalants, sedatives, hallucinogens, or opioids, and 0 = I have NEVER used any of the following substances: tobacco, alcohol, marijuana, cocaine, amphetamines, inhalants, sedatives, hallucinogens,

or opioids. If participant answered 0, the overall score for substance use was 0, and they were instructed to (Skip to end of WHO_ASSIST).

If participant answered 1, they continued the survey to answer further questions. "In your life, which of the following substances have you ever used? (DO NOT include substances used for medical reasons.)" The response options were coded, 0= No, 3= yes. The following substances were listed, Tobacco products (cigarettes, e-cigs, chewing tobacco, cigars, etc.); Alcoholic beverages (beer, wine, liquor, etc.); Cannabis (marijuana, weed, grass, pot, hash, etc.); Cocaine (coke, crack, girl, white lady, etc.); Amphetamine type stimulants (meth, ice, molly, ecstasy, speed, bath salts, Adderall, etc.); Inhalants (nitrous, gas, poppers, rush, glue, petrol, paint thinner, etc.); Sedatives or sleeping pills (Valium, Xanax, Klonopin, Soma, Ambien, roofies, Serepax, Rohypnol, etc.); Hallucinogens (LSD, acid, mushrooms, PCP, DMT, Special K, etc.); Opioids (heroin, boy, morphine, K-4, methadone, suboxone, purple drink, codeine/cough syrup, etc.); Other- please specify (for example: synthetic weed, spice, etc.). The WHO_ASSIST total score was a sum of the number of categories of substances a person reported using with a potential range of 0-9.

***HIV, STI, and/or Condom Use Conversations***

The conversations variable are conversations about HIV, STI, and/or Condom Use. Participants were asked to "Think about your current (or most recent) sexual relationship. Have you ever talked about any of the following?" The responses were a= HIV or AIDS, b= STDs other than HIV, such chlamydia or gonorrhea, and c= Using condoms, 1= yes, and 0= no. Because there were several response options for this variable, they were summed and renamed "Sexual Health Conversations."

### *Peer Norms*

The peer norms variables are both continuous and categorical. For the two continuous (Norm 2 and Norm 4) variables, participants were asked two questions about their friends and peers' lifetime sexual partners. For the categorical (Norm 5) variable, participants were asked about their friends' condom use during sex. Participants were told, "First, though, I want you to think about all the young adults (18-25) living in the U.S. Participants were asked, "How many sex partners do you think someone your age has had during their lifetime?" and "How many sex partners do you think your friends have had during their lifetime?" Because these two variables are both asking questions about peers, they were averaged together for the analysis. This variable was named Perceived Lifetime Sexual Partners of Peers. Participants were also asked, "How many of your friends do you think used a condom the last time they had sex? The options for this question were coded: Responses were coded: 1= all of them; 2= most of them; 3= about half of them; 4= a few of them; 5= none of them. This variable was named Perceived Unprotected Sex of Peers.

### *Main Partner*

The question pertaining to a main partner are: Do you have a current main or committed partner who only has sex with you? The options were coded: 0= Not having a main partner and 1 = having a main partner.

CHAPTER 5

# STATISTICAL DATA ANALYSES

All analyses were performed in Statistical Package for the Social Sciences (SPSS; version 27; IBM Corp, 2020). Descriptive statistics were used to report sample characteristics, means and standard deviations for continuous measures, along with frequencies and percentages for categorical variables (Table 1). Chi-square tests of independence for categorical variables (Table 2) and One-way analysis of variance (ANOVAs) for continuous variables (Table 3) were performed to examine the bivariate relationships between variables of interest and unprotected sex group. The hypotheses were assessed by looking at covariate-adjusted associations using a multinomial logistic regression (MLR) with the percentage of unprotected sexual events put into three categories (never, sometimes, and always) from the TLFB as the dependent variable (DV; Table 4). MLR is used to model nominal outcome variables, and the log odds of the outcomes are modeled as a linear combination of the predictor variables (Agresi, 1996; Hosmer and Lemenshow, 2000; Long and Freese, 2006). Additional variables that were used as predictors in the model included: total number of sexual events, age, education, substance use, financial difficulty, female gender, conversations, main partner, perceived lifetime sexual partners of peers, and perceived unprotected sex of peers.

To indicate if any variables violated assumptions, such as the linearity of the logit, independence of errors, multicollinearity, extreme outliers, and zero cell counts, assumption testing procedures were performed. A Box Tidwell was performed to test the

linearity of the logit. A linear regression, with the unprotected sex groups as the dependent variable, and the predictors; total number of sexual events, age, education, substance use, financial difficulty, female gender, conversations, main partner, perceived lifetime sexual partners of peers, and perceived unprotected sex of peers, was performed to test the remaining assumptions. After computing the ln(X) for each continuous predictor (X) along with the interaction terms X*ln(X) and preforming the logistic regression with all variables and the interactions, all interactions were non-significant. In addition, all scatterplots and relationships were linear. This indicated that there was no violation of the linearity of the logit assumption. However, the interaction was significant for the total number of sexual events variable. This indicated that the variable violated linearity of the logit assumption. Therefore, a log transformation was performed on the variable, but the transformation was unsuccessful. Then, square, and cubed root transformations were performed. Those transformations were also unsuccessful. Later, an inverse transformation was performed. Due to being extremely skewed, the inverse transformation did not completely normalize the variable, but it was better than the log, square, and cubed transformations. Therefor the inverse sexual events variable was used in the covariate-adjusted analyses. After performing the linear regression, all predictor variables met the remaining assumptions **(**independence of errors, multicollinearity, extreme outliers, and empty cell counts). There were no empty cell counts because both genders engaged in unprotected sex. There was no multicollinearity because the tolerance for each predictor was not less than .4 and the variance inflation factor is between 1-2.5 (Kim, 2019).

CHAPTER 6

# RESULTS

See Table 1 for a summary of all variables that were used in the analyses. It displays the dataset's main features and characteristics. It also details the mean and standard deviations for continuous variables, and the total (n's) and percentages for categorical variables. The descriptive statistics table also details the main predictors, covariates, and the outcome. There were 228 B/AA emerging adults (mean age 21.54; 56.6% female).

**Table 1: Descriptive Statistics (n=228)**

| Variables | Mean (SD) | n (%) | *Min | *Max |
|---|---|---|---|---|
| Age | 21.54 (2.08) | | 18 | 25 |
| Substance Use Categories | 2.45 (1.80) | | 0 | 9 |
| Education | 13.33 (1.46) | | 9 | 17 |
| Sexual Health Conversations | 2.28 (.98) | | 0 | 3 |
| *Number of SE 3 months prior | 14.9 (14.49) | | 0 | 85 |
| *PLSP of Peers | 11.73 (9.81) | | 1 | 51 |
| Female | | 129 (56.6%) | | |
| Have a Main Partner | | 177 (77.6%) | | |
| Financial Difficulty | | | | |
| 4 | | 38 (16.7%) | | |
| 3 | | 77 (33.8%) | | |
| 2 | | 69 (30.3%) | | |
| 1 | | 44 (19.3%) | | |
| Perceived Unprotected Sex of Peers | | | | |
| none of them | | 51 (22.4%) | | |
| a few of them | | 77 (33.8%) | | |
| about half of them | | 47 (20.6%) | | |
| most of them | | 33 (14.5%) | | |
| all of them | | 20 (8.8%) | | |
| Unprotected Sex Groups | | | | |
| Never | | 55 (24.1%) | | |
| Sometimes | | 66 (28.9%) | | |
| Always | | 107 (46.9%) | | |

Note: Perceived Unprotected Sex of Peers: 5= none of them; 4= a few of them; 3= about half of them; 2= most of them; 1= all of them. Financial difficulty: 4= Not enough to pay some bills, no matter how hard you try; 3= Enough to pay bills but have had to cut back; 2= Enough to pay bills without cutting back, but no "extras"; 1= Enough money for "extras. Sexual Health Conversations = Conversations about HIV, STI, and/or Condom Use 1= yes and 0= no. Because there were several response options for this variable, they were summed. *PLSP = Perceived Lifetime Sexual Partners. *Number of SE = Number of Sexual Events. *Min = Minimum; *Max = Maximum.

***Bivariate Associations***

Chi-square tests of independence (Table 2) and One-way ANOVA (Table 3) were performed to examine the bivariate relationships between variables of interest and unprotected sex group. The Chi-square association showed that female gender with the unprotected sex categorical variable was significant, $X^2$ (2) = 16.608, p <.001. Of the 129 females, 75 (58.1%) were in the "always" unprotected sex category compared to 32 of the 99 males (32.3%). The association of having a main partner with the unprotected sex category was significant, $X^2(2) = 10.137$, p = .006. There were 177 participants who reported having a main partner, and 93 of them (52.5%) were categorized in the "always" unprotected sex category compared to 14 of the 51 (27.5) individuals who did not have a main partner. The association of Perceived Unprotected Sex of Peers and the unprotected sex category the was significant, $X^2$ (8) = 30.311, p <.001. For example, of the 51 participants who reported none of their friends used a condom during sex, 32 (62.7%) were in the "always" unprotected sex category, 14 (27.5%) where in the "sometimes" unprotected sex category, and 5 (9.8%) were in the "never" unprotected sex category. The association of financial difficulty with the unprotected sex category was non-significant. $X^2(6) = 5.029$, p = .540.

A one-way ANOVA revealed there was a statistically significant difference between the means of the unprotected sex categories for Perceived Lifetime Sexual Partners of Peers [F (2, 225) = [10.993], p <.001. The mean for the "never" category is 7.9. The mean for the "sometimes" category is 15.8 and the mean for the "always" category is 11. The total number of sexual events differed by unprotected sex category [F (2, 225) = [5.920], p = 003. The mean for the "never" category is .9.85. The mean for the

"sometimes" category is .14.33 and the mean for the "always" category is 17.90. Substance Use also differed based on unprotected sex category [F (2, 225) = [4.395], p = .013. The mean for the "never" category is 1.83. The mean for the "sometimes" category is 2.66 and the mean for the "always" category is 2.66. There was not a statistically significant difference between the means the following variables by unprotected sex category: conversations [F (2, 225) = [.751], p = .473; education [F (2, 225) = [.434], p = .648; and age the unprotected sex category [F (2, 225) = [.034], p = .966.

**Table 2: Associations between Variables of Interest and Unprotected Sex**

| Variables | Unprotected Sex (Categorical) | | | chi-square | p-value |
|---|---|---|---|---|---|
| | Never (n = 55) | Sometimes (n = 66) | Always (n = 107) | | |
| Sex, n (%) | | | | (16.608) | <.001 |
| Female | 28 (21.7%) | 26 (20.2%) | 75 (58.1%) | | |
| Male | 27 (27.3%) | 40 (40.4%) | 32 (32.3%) | | |
| Main Partner, n (%) | | | | (10.137) | .006 |
| No | 16 (31.4%) | 21 (41.2%) | 14 (27.5%) | | |
| Yes | 39 (22.0%) | 45 (25.4%) | 93 (52.5%) | | |
| Financial Difficulty n (%) | | | | (5.029) | .540 |
| 4 | 10 (26.3%) | 10 (26.3%) | 18 (47.4%) | | |
| 3 | 18 (23.4%) | 23 (29.9%) | 36 (46.8%) | | |
| 2 | 12 (17.4%) | 20 (29%) | 37 (53.6%) | | |
| 1 | 15 (34.1%) | 13 (29.5%) | 16 (36.4%) | | |
| Perceived Unprotected Sex of Peers, n (%) | | | | (30.311) | <.001 |
| none of them | 5 (9.8%) | 14 (27.5%) | 32 (62.7%) | | |
| a few of them | 14 (18%) | 23 (29.9%) | 40 (51.9%) | | |
| about half of them | 10 (21.3%) | 15 (31.9%) | 22 (46.8%) | | |
| most of them | 18 (54.5%) | 7 (21.2%) | 8 (24.2%) | | |
| all of them | 8 (40%) | 7 (35%) | 5 (25%) | | |

Note: Perceived Unprotected Sex of Peers: 5= none of them; 4= a few of them; 3= about half of them; 2= most of them; 1= all of them. Financial difficulty: 4= Not enough to pay some bills, no matter how hard you try; 3= Enough to pay bills but have had to cut back; 2= Enough to pay bills without cutting back, but no "extras"; 1= Enough money for "extras.

**Table 3: Associations between Variables of Interest and Unprotected Sex**

| Variables | Unprotected Sex (Categorical) | | | F- ratio | p-value |
|---|---|---|---|---|---|
| | Never (n = 55) | Sometimes (n = 66) | Always (n = 107) | | |
| Age, mean (SD) | 21.49 (2.3) | 21.53 (2.2) | 21.58 (2.0) | .034 | .966 |
| Education, mean (SD) | 13.29 (1.4) | 13.21 (1.5) | 13.42 (1.4) | .434 | .648 |
| Conversations, mean (SD) | 2.34 (.985) | 2.37 (.855) | 2.2 (1.05) | .751 | .473 |
| *Substance Use, mean (SD) | 1.84 (1.4) | 2.66 (2.06) | 2.66 (1.76) | 4.395 | .013 |
| *Number of SE, mean (SD) | 9.85 (13.8) | 14.3 (13.72) | 17.9 (14.63) | 17.857 | <.001 |
| *PLSP of Peers, mean (SD) | 7.96 (5.34) | 15.8 (13.47) | 11.13 (7.87) | 10.992 | <.001 |

Note: Sexual Health Conversations = Sexual Health Conversations about HIV, STI, and/or Condom Use 1= yes, and 0= no. Because there were several response options for this variable, they were summed. *PLSP = Perceived Lifetime Sexual Partners. *Number of SE = Number of Sexual Events 3 months prior. *Substance Use = Substance Use Categories.

***Multinomial Logistic Regression: Likelihood Ratio Tests***

The Likelihood ratio tests show that the independent variables: female, substance use, main partner, perceived norms of unprotected sex of peers, perceived norms of lifetime sexual partners of peers, and the total number of sexual events collectively contribute significantly to the predictive model; [LR $X^2$ (20) = 93.914, p <.001.] Based on the McFadden Pseudo $R^2$, the full model containing the predictors represents a 19.5% improvement in fit relative to the null model.

**Multinomial Logistic Regression: Predictors of participants being categorized in the "sometimes" unprotected sex category compared to the "never" unprotected sex category.**

The age predictor is negative and significant meaning older participants are at lower risk for being categorized in the “sometimes” unprotected sex category compared to the never unprotected sex category (B= -.232, OR=.793, [CI=.632, .994], p =.044). Each 1 year older a participant gets, the log odds of a participant falling in the “sometimes” category (relative to the never category) is predicted to decrease by .232. The perceived unprotected sex of peers predictor is positive and significant; meaning that participants who report perceiving that their peers are not using a condom during sexual intercourse are at a higher risk for being categorized in the “sometimes” unprotected sex category compared to the never unprotected sex category (B =.449, OR =1.567, [CI=1.111, 2.209], p = .010). For each one unit increase on the perceived unprotected sex of peers variable, the log odds of a participant falling in the “sometimes” category (relative to the “never” category) is predicted to increase by .449 units.

The perceived lifetime sexual partners of peers predictor is positive and significant; meaning that participants who report perceiving that their peers have a high number of lifetime sexual partners are at a higher risk for being categorized in the “sometimes” unprotected sex category compared to the never unprotected sex category (B =.109, OR = 1.115, CI [1.037, 1.198], p =.003). For each one unit increase on the perceived lifetime sexual partners variable, the log odds of a participant falling in the “sometimes” category (relative to the “never” category) is predicted to increase by .109 units.

The number of sexual events predictor (inverse of the variable was used in the model) is negative and significant; meaning that participants who are engaging in more sexual events are at higher risk for being categorized in the "sometimes" unprotected sex

category compared to the never category (B = -4.477, OR= .011, CI [.000,.337], p =.010). For each one unit decrease on the inverse of total number of sexual events variable, the log odds of a participant falling in the "sometimes: category (relative to the "never" category) is predicted to increase by 4.477 units.

**Multinomial Logistic Regression: Predictors of participants being categorized in the "always" unprotected sex category compared to the "never" unprotected sex category.**

The substance use predictor was positive and significant meaning that participants who report engaging in higher levels of substance use are at a higher risk for being categorized in the "always" unprotected sex category compared to the never category (B = .366, OR=1.442, CI [1.096,1.897], p = .009). For each one unit increase on the substance use variable, the log odds of a participant falling into the "always" category (relative to the "never" category) is predicted to increase by .366 units. The perceived unprotected sex of peers predictor is positive and significant meaning that participants who report perceiving that their peers are not using a condom during sexual intercourse are at a higher risk for being categorized in the "always" unprotected sex category compared to the never unprotected sex category (B =.621, OR =1.862, CI [1.338,2.590], p <.001). For each one unit increase on the perceived unprotected sex of peers variable, the log odds of a participant falling in the "always" category (relative to the "never" category) is predicted to increase by .621 units.

The perceived lifetime sexual partners of peers predictor is positive and significant; meaning that participants who report perceiving that their peers have a high number of lifetime sexual partners are a at high risk for being categorized in the "always" unprotected sex category compared to the never unprotected sex category (B =.076, OR =

1.079, CI [1.005, 1.158], p =.037). For each one unit increase on the perceived lifetime sexual partners of peers variable, the log odds of a participant falling in the “always” category (relative to the “never” category) is predicted to increase by 0.76 units. The number of sexual events predictor (inverse) is negative and significant; meaning that participants who are engaging in more sexual events are at higher risk for being categorized in the "always" unprotected sex category compared to the never (B= -5.232, OR=.005, CI [.000, .161], p =.003). For each one unit decrease on the inverse sexual events variable, the log odds of a participant falling in the “always” category (relative to the “never” category) is predicted to increase by 5.232 units.

**Table 4: Covariate-adjusted Associations: Multinomial Logistic Regression for Predictors of Never vs. Sometimes and Never vs. Always Engaging in Unprotected Sexual Events**

| Variables | Sometimes | | | Always | | |
|---|---|---|---|---|---|---|
| | B | OR | 95% CI | B | OR | 95% CI |
| Age | -.232 | *.793 | [.632, .994] | -.169 | .844 | [.684, 1.042] |
| *Substance | .258 | 1.295 | [.975, 1.720] | .366 | *1.442 | [1.096, 1.897] |
| *Number of SE | -4.477 | **.011 | [.000, .337] | -5.232 | *.005 | [.000, .161] |
| *PUS | .449 | **1.567 | [1.111, 2.209] | .621 | ***1.862 | [1.338, 2.590] |
| *PLSP | .109 | *1.115 | [1.037, 1.198] | .076 | *1.079 | [1.005, 1.158] |
| *Convers | .017 | 1.017 | [.639, 1.619] | -.342 | .710 | [.463, 1.090] |
| *Main Part | -.456 | .634 | [.233, 1.726] | .666 | 1.946 | [.691, 5.482] |
| Female | -.390 | .677 | [.281, 1.627] | .627 | 1.872 | [.805, 4.356] |
| Education | .030 | 1.030 | [.763, 1.391] | .102 | 1.107 | [.831, 1.475] |
| *Financial | -.015 | .985 | [.637, 1.523] | .013 | 1.013 | [.675, 1.520] |

Note: Never is the reference group. B = Standardized Beta; OR = Odds Ratio; CI = Confidence Interval. *p <.05; **p = .01; ***p < .001. *Convers = Conversations about HIV, STI, and/or Condom Use 1= yes and 0= no. Because there were several response options for this variable, they were summed. *PLSP = Perceived Lifetime Sexual Partners of Peers; *PUS = Perceived Unprotected Sex of Peers; *Number of SE = Number of Sexual Events 3 months prior; *Financial = Financial Difficulty; *Substance Use Categories; *Main Part = Have a main partner.

CHAPTER 7

# DISCUSSION

### *Summary of Bivariate Findings*

Being a female, having a main partner, and higher levels of perceived unprotected sex of peers were significantly associated with engaging in higher levels of unprotected sex. There was not a significant association between financial difficulty and engaging in unprotected sex in this sample. Participants who reported higher levels of perceived lifetime sexual partners of peers, total number of sexual events, and engaging in substance use were engaging in higher levels of unprotected sex. The findings did not indicate a statistically significant difference between the means and unprotected sex for sexual health conversations, education, and age in this sample.

### *Summary of the Covariate-adjusted Associations Findings*

Older individuals are less likely to have unprotected sex, perceiving your peers as having unprotected sex increases the odds of having unprotected sex, engaging in higher levels of substance use sex increases the odds of having unprotected sex, and perceiving more peer sexual partners and having more sexual partners increased the odds of having unprotected sex.

## Similarities and Differences between Current Study and Previous Literature

### *Peer Norms, Substance Use, and Number of Sexual Events*

Similar to previous literature, this current study also indicated that peer norms are an important influence on the sexual behavior of individuals. Results from a study

conducted by van de Bongardt et al. (2015) indicated that a participant's sexual activity was more strongly associated with descriptive norms, such as, perceptions of peer sexual activity and peer sexual risk behavior. Findings from this current study also indicated that individuals who reported engaging in higher levels of substance use were more often engaging in higher levels of unprotected sex. This finding is similar to previous literature which indicated that alcohol and drugs is related to other high-risk behaviors. This can lead to poor decision making, such as, engaging in unprotected sex while under the influence of any substance (Kogan et al., 2010; Tucker et al., 2012). Individuals who engaged in higher levels of substance use were more likely to become sexually active and engaged in more unprotected sexual events (Ritchwood et al., 2015). This current study found that higher levels of oral, anal, and vaginal sexual events were associated with sometimes or always engaging in unprotected sex. These current results are similar to previous literature which concluded that anal sex among the heterosexual population is very common and is a much greater risk for contracting HIV (Baggaley et al., 2013).

***Female Sex, Main Partner, and Age***

Similar to previous literature, this current study also indicated that females engage in higher levels of unprotected sex when compared to males. A study by Ayoola et al. (2007) concluded that females engaged in unprotected sex due to several individual level factors, such as, lack of knowledge and associating condoms with lack of trust. The same study by also indicated interpersonal level factors that are associated with unprotected sex among females. Some factors are, partners who discouraged condom use, and having peers who discouraged condom use (Ayoola et al., 2007). Similar to previous literature, findings from this current study also indicated that participants who report having a main

partner were engaging in more unprotected. Results from previous literature indicated that the level of unprotected sex was substantially higher among participants with a main partner (Lescano et al., 2006; Greene et al., 2014). A study conducted by Boraddus et al. (2016) found a positive relationship between unprotected sex and having a main partner. This current study indicated that older participants were less likely to sometimes engage in unprotected sex. The results from this current study are similar to a study conducted by Chambliss et al (2015) indicated that older participants were less likely to use a condom during sexual intercourse when compared to younger participants.

***Financial Difficulty, Conversation, and Education***

Different from previous literature, this current study did not find any significant associations with financial difficulty, condom use and sexual health conversations, levels of education, and engaging in unprotected sex. Even though the financial difficulty hypothesis was not supported, research has indicated a consistent relationship between low-income communities, low-income individuals, and unprotected sex. Individuals residing in low-income communities were shown to engage in higher levels of unprotected sex and had higher rates of STIs (Biello et al., 2010). Previous literature also indicated that individuals who communicated with their partners about condom use, and sexual health topics were less likely to engage in unprotected sex (Bond et al., 2018). Lastly, regarding education, unlike this current study, previous literature indicated that individuals with a four year or community college degree were less likely to test positive for STIs and engage in unprotected sex (Rosenbaum, 2018). Also, having a college degree could potentially reduce sexual health disparities (Rosenbaum, 2018). Overall, researchers should continue to investigate financial difficulty, condom use and sexual

health conversations, and levels of education among the B/AA population because these factors affect and play a role in sexual health decisions among B/AA emerging adults.

### *Directions for Potential Interventions*

Sexual health research that uses a social science and psychological perspective to address the socio-cultural factors associated with sexual health disparities can potentially reduce unprotected sex amongst the B/AA. Potential interventions should investigate how to mitigate consistent unprotected sex related challenges by creating sexual education courses within junior and high school settings, creating more STI interventions, and by conducting research to shape policies that are related to STI and HIV prevention, treatment, and care. The interventions and researchers should use relatable messaging and build foundations for community involvement. Potential interventions should consider addressing perceived norms and substance use and could be beneficial in emerging adults B/AA females who reported more unprotected sex than B/AA males in this sample. Lastly, potential interventions should incorporate situation-specific alcohol and drug use into interventions that target STIs, HIV, and unprotected sex (Pellowski et al., 2018).

Previous literature indicated there are many factors associated with increased STI and HIV risk, and unprotected sex, such as, depression, discrimination, institutional racism, unstable or inadequate housing, trauma, and lack of health insurance and community resources (Vitsupakorn et al., 2023). B/AA constantly face socio-cultural and psychological conditions that impact their sexual health, which further leads to contracting a STI or HIV and engaging in unprotected sex (Crooks et al., 2022). Therefore, potential interventions should further investigate unprotected sex at the community, institutional, and policy levels of the SEM. The SEM provides a contextual

framework for potentially overcoming sexual health disparities and mitigating unprotected sex among B/AA. Overall, this current study gave truthful insight on what should be addressed throughout future research, and it further indicated why it's important to study the B/AA population beyond the individual and biological factors. One strength to this current study is the use of the SEM and cross-sectional data. Using the SEM and cross-sectional data allowed researchers to study multiple outcomes and exposures.

### *Limitations*

This current study primarily concentrated on B/AA emerging adults (males and females) ages 18-25, which limits the generalization of findings to a broader demographic. Adding a more representative sample would increase the external validity and would have allowed for a deeper understanding of how other cultural, race, and socioeconomic factors play a role in unprotected sex. Also, including participants over the age of 25 would have allowed for a variety of differences in behavior; since research indicates that people change behaviors as they get older (Crooks et al., 2022). Another limitation is self-reporting which is subjected to biases, such as honesty, recall bias, and social desirability. Participants may provide a more socially acceptable answer rather than being truthful. The substance use variable is a limitation because it assessed substance use within a person's lifetime, but the outcome (unprotected sex) assessed the three previous months of a person's life. Some hypotheses were also not supported potentially due to the nonlinearity and the extremely skewed sexual events variable.

### *Implications*

The findings from this current study have both theoretical and practical implications. At the theoretical level, the findings align with the idea that perceived norms and substance use are extremely important when determining why individuals engage in unprotected sex. These variables also align with practical implications because perceived norms and substance use can potentially predict a person's behavior. This current study is important in the field of sexual health and STIs because it continues to demonstrate that substance use, increased sexual intercourse, and peer norms have a huge impact on the sexual health status among B/AA ages 18-25 years old. Substance use is linked to STIs and HIV in several ways, such as, individuals who engage in substance use may attempt to support their cravings by exchanging sex for substances. In addition, sexual activity could potentially be linked to substance use to enhance the pleasure of sexual intercourse. Therefore, in these instances engaging in unprotected sex is highly likely because individuals are looking for quick pleasure (National Academies of Sciences, Engineering, and Medicine, 2021).

Previous literature has also indicated that STIs are extremely high in the southern states among B/AA individuals, and that over one million STI cases were reported to the CDC (Dionne-Odom et al., 2017). Therefore, educational interventions should continue to target the southern states in an unstigmatized perspective. This is another example of why researchers should incorporate more socio-cultural and psychological factors into interventions that target sexual health among B/AA individuals (Crooks et al., 2020, Crooks et al., 2022). Socio-cultural factors are also critical for understanding the sexual health behaviors of B/AA individuals. Understanding those socio-cultural factors could

help prevent STI/HIV among the B/AA population, and researchers could protect the sexual health of B/AA.

This current study is also important because it gives researchers, primary care physicians, and public health practitioners, an idea of the challenges that B/AA are faced with daily. For researchers, the findings in this study provide new insights as how to address sexual health related challenges and disparities among B/AA from an unbiased perspective. More longitudinal interventions are needed to better understand sexual health disparities from all levels of the SEM. Lastly, researchers who are planning to implement interventional studies should consider developing comprehensive sex education courses in high schools in Birmingham, AL. For physicians and public health professionals, these findings provide new insights as to how to provide B/AA patients with the proper STI/ HIV knowledge and sexual health resources that can potentially lead to safe sex practices.

Health professionals should strive to reduce inadequate health care services when providing treatment to the B/AA population. Overall, it's important for the B/AA populations to discuss all sexual health challenges with their primary care physicians because this would allow for a greater understanding and trust between them. For family, friends and peers, these findings provided insight on the importance of interpersonal relationships. These relationships are critical when B/AA are attempting to form a sense of self-efficacy and self-confidence toward their sexual health decisions (Sayles et al., 2006).

## CONCLUSION

Overall, the findings from this current study support many findings from previous literature because it demonstrated the different connections and intersections that influence unprotected sex and sexual health disparities among B/AA individuals. There are different factors that shape the sexual health decisions among this population; the SEM is useful to further understand these factors. Using condoms during any type of sexual intercourse is vital to prevent STIs and HIV. When conducting research on unprotected sex amongst B/AA emerging adults ages 18-25, its extremely important to consider certain predictors such as, substance use, peer norms, and sexual events. Even though certain hypotheses were not supported, researchers should still investigate financial difficulty and education level when looking into a person's sexual health life and history in other contexts. Lastly, researchers should consider looking into a social science and psychological perspective, which can potentially be an effective way to combat unprotected sex and sexual health disparities among the B/AA population.

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# APPENDIX A

## INSITUTIONAL REVIEW BOARD FOR HUMAN USE APPROVAL LETTER

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 |
irb@uab.edu

## NHSR DETERMINATION

**TO:** Gray, Shirlacia S

**FROM:** University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance # FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)
IORG Registration # IRB00012550 (IRB 03)

**DATE:** 01-Jun-2022

**RE:** IRB-300009146
Using the Social Ecological Model to Access the Correlates of Condom Usage and Risky Sexual Behaviors among African American Emerging Adults

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The Office of the IRB has reviewed your Application for Not Human Subjects Research Designation for the above referenced project.

The reviewer has determined this project is not subject to FDA regulations and is not Human Subjects Research. Note that any changes to the project should be resubmitted to the Office of the IRB for determination.

if you have questions or concerns, please contact the Office of the IRB at 205-934-3789.

**Additional Comments:**

Secondary analysis of de-identified data from IRB-150219009, Susan Davies, PI, CITY Health II Study

UAB SCHOOL OF PUBLIC HEALTH

May 24, 2022

To: Shirlacia Gray

From: Susan Davies, PI, CITY Health II Study

RE: Permission for use of data

Title: "Using the Social Ecological Model to Access the Correlates of Condom Usage and Risky Sexual Behaviors among African American Emerging Adults."

This memo serves to document that Shirlacia Gray has my permission to analyze the data collected during the project, "CITY Health II (Community Influences Transitions of Youth Health)," expressly for her thesis project titled, "Using the Social Ecological Model to Access the Correlates of Condom Usage and Risky Sexual Behaviors among African American Emerging Adults."

Shirlacia will receive a deidentified dataset that does not include any personal identifiers.

Data were collected with the approval of the UAB Institutional Review Board (IRB), protocol number IRB-150219009. The original study is closed to ongoing data collection; therefore, IRB approval is required. Shirlacia has obtained IRB approval. The IRB Project Number IRB-300009146.

Sincerely,

Professor (retired)
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