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Using Social Cognitive Theory to Explore the Influence of Sexual Health Education on Young Adults

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2015

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Abstract

Using Social Cognitive Theory to Explore the Influence of
Sexual Health Education on Young Adults

By Ashley L. Phillips

Introduction. While 15-24 years olds are only 25% of the sexually active population in the U.S., they make up half of new sexually transmitted infections (STIs). Young adults face barriers to adopting positive sexual health behaviors—condom use, STI testing, partner communication—and receive sexual health education from multiple sources. Utilizing the Social Cognitive Theory, the current study assessed relationships between personal determinants (knowledge, self-efficacy), environmental determinants (education source, receipt of education before or after first sexual encounter), and behavioral determinants (condom use, STI testing, partner communication) to better understand the effects of different educational sources on young adults' sexual health behaviors.

Methods. This was a cross-sectional study of sexually active 18-24 year old college students and graduates. Data was gathered via on online survey on participant demographics, determinants of sexual health, and being from the Southern vs. non-Southern U.S.

Results. 272 individuals completed this study. Education from parents, friends, and doctors were each associated with condom use self-efficacy, STI testing knowledge, and STI testing behavior. Education from parents and doctors were each associated with STI testing self-efficacy and partner communication about STI testing and condom use, respectively. Education from doctors, as well as from a class or program in college, was associated with condom use during vaginal sex. The total number sexual health education sources was associated with condom use self-efficacy, STI testing knowledge, STI testing self-efficacy, and partner communication about STI testing behavior. In turn, condom use self-efficacy, STI testing knowledge, and STI testing self-efficacy were each associated with partner communication about STI testing and STI testing behavior. Finally, those from the Southern U.S. were more likely to have had an STI and received sexual health education from friends before their first sexual encounter, and less likely to have received sexual health education from middle or high school.

Implications. Initiatives to improve sexual health knowledge and self-efficacy should encourage doctors and parents in particular to educate their patients and children. Young adults appear to understand risk behaviors, but need to be given the tools they need to reduce risk through reinforcement from multiple different educational sources.

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Finally, thank you to my study participants. I am grateful for the time they spent supporting this project and I am hopeful their input will represent a valuable contribution to the field of adolescent sexual and reproductive health. I am especially thankful to those who shared the survey with their own networks, taking the initiative to assist me in recruitment and overall making this study possible.

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Tables & Figures

Background

Each year, nearly 20 million new sexually transmitted infections (STIs) occur in the United States.[1] In 2015 alone, roughly 1.5 million cases of chlamydia, nearly 400,000 cases of gonorrhea, and over 20,000 cases of primary and secondary syphilis were reported.[2] Other prevalent STIs include human papilloma virus (HPV), herpes simplex virus (HSV), and *Trichomonas vaginalis*; however, these STIs do not have nationally reportable rates.[2] The high STI burden in the U.S. is significant because STIs can be costly, both physically and financially. Not only can certain STIs lead to additional health complications among women, such as pelvic inflammatory disease, cervical cancer, ectopic pregnancy, and infertility,[2] but also the national cost of treating curable STIs is around $742 million annually.[1] These consequences could be avoided if sufficient preventive measures are taken, namely increased condom use to protect against STI transmission[3] and early and regular STI testing[4] to detect infections before they spread. Additionally, being able to communicate with one's partner about condom use and STI testing history can help individuals take ownership of their sexual health and increase their ability to avoid STIs.[5]

STIs can be spread through several different types of sexual activity, including oral, vaginal, and anal sex.[6] A national study found that among men 20-24 years old, 70.3% had ever engaged in vaginal sex, 73.5% had received oral sex from a female, 70.9% had given oral sex to a female, and 34.5% had engaged in anal sex; among women, 85.6% had ever engaged in vaginal sex, 79.7% had received oral sex from a male, 77.6% had given oral sex to a male, and nearly 39.9% had engaged in anal sex.[7] These high rates of sexual activity may partially explain the strikingly high STI rates among young adults 15-24: while young adults make up only 25% of the sexually active U.S. population, they account for roughly

half of all new STIs.[8] These include 45% of HSV-2, 70% of gonorrheal, 63% of chlamydial, and 49% of HPV infections.[1] This disproportionate burden of STIs among sexually active young adults indicates a pressing need for increased exploration into sexual health knowledge and barriers among this population.

In addition to their sexual behaviors—including types of sex, condom use, STI testing, and partner communication about condom use and STI testing—other personal and environmental factors may contribute to high STI rates among young adults. The social cognitive theory (SCT) offers a conceptual framework that may explain how these factors potentially interact to shape young adults' sexual health. SCT suggests that rather than behavior being affected uni-directionally by personal and/or environmental factors, these three facets of psychosocial functioning demonstrate triadic reciprocal causation (Figure 1).[9] Specifically, SCT proposes that one's personal determinants—including knowledge and perceived self-efficacy[10]—behavioral determinants, and environmental determinants of health are all interrelated.[9] Bandura suggests that SCT can be utilized in developing health promotion efforts to induce health behavior change among individuals.[10]

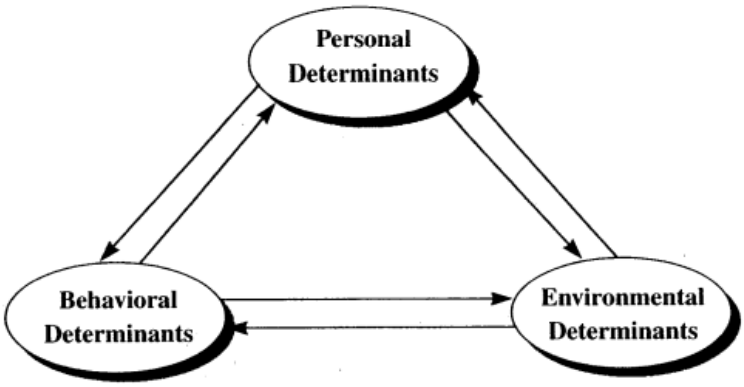

Figure 1. Schematic of triadic reciprocal causation in Social Cognitive Theory[11]

Previous research has demonstrated the effectiveness of employing SCT to improve sexual health behaviors, specifically. Several studies have found that SCT-framed interventions can successfully increase condom use behavior and reduce STI incidence.[12-15] By conceptualizing young adults' sexual health behaviors as functioning within this framework, a better understanding of how young adults' condom use and STI testing knowledge and self-efficacy (personal determinants) and source of sexual health education (environmental determinants) simultaneously influence their condom use, STI testing, and partner communication behavior (behavioral determinants).

Introduction

Sexual Health among Young Adults

The percentage of young adults who have their first sexual encounter nearly doubles between 17 and 20 years of age.[16] Incidentally, this age coincides with the age at which young adults typically attend college. The 2014 National College Health Assessment found that within the past 12 months, 64.6% of undergraduate students had engaged in sexual activity and 23.4% had engaged in sexual activity with 2 or more partners.[17] However, of those who had ever had vaginal, oral, or anal sex, 17% reported never using a condom during vaginal sex, 61% reported never using a condom during oral sex, and 21% reported never using a condom during anal sex, respectively.[17] This degree of multiple partners and unprotected sexual activity indicates that college students need to be equipped with adequate knowledge and skills to prevent and reduce STI transmission. These include consistent and correct condom use[3] and STI testing.[4] The CDC's *Get Tested* Campaign highlights the fact that testing is important because it can inform individuals of a positive STI status, allowing them to seek treatment, hopefully before the infection is

transmitted to the infected person's sexual partner(s).[4] Persistently high rates of STIs and generally low reported rates of condom use among young adults indicate that this population could benefit from increased support in adopting positive sexual health behaviors. In order to better understand this phenomenon, it is important to explore potential barriers young adults may be facing to adopting healthy sexual behaviors as well as the environmental context within which they learn about sexual health-promoting behaviors.

Social Cognitive Theory and Young Adults' Sexual Health

As noted, SCT provides a useful framework for conceptualizing health behavior. SCT can be broken down into three main constructs that demonstrate triadic reciprocal causation, or reciprocal determinism: personal determinants, behavioral determinants, and environmental determinants.[9] In their discussion of SCT, Glanz et al note that while the theory recognizes that environment influences behavior, SCT "focuses on people's potential abilities to alter and construct environments to suit purposes they devise for themselves," suggesting also that organizations can play a role in achieving beneficial environmental change.[18] In other words, individuals can shape their environments to meet the needs of their personal determinants, which can affect their behaviors, which can foster environments that are amenable to this behavior, etc. In terms of sexual health, these environments can be conceptualized as the environment in which young adults receive sexual health education (environmental determinants). Sexual health education, therefore, has a reciprocal relationship with young adults' sexual health knowledge and self-efficacy (personal determinants). For example, sexual health education may influence sexual health knowledge and self-efficacy, and as knowledge and self-efficacy change, educational needs

will adapt to meet these changes. In turn, sexual health education, knowledge, and self-efficacy may all influence young adults' propensity to use condoms, seek STI testing, or talk to their partners about sexual health (behavioral determinants). As young adults' sexual health behaviors change, their knowledge, self-efficacy, and educational needs will change as well. Thus, demonstrating the reciprocal determinism described by SCT.

Within this larger SCT framework of personal, behavioral, and environmental determinants lies additional key concepts of SCT. These include reciprocal determinism, outcome expectations, self-efficacy, collective efficacy, observational learning, incentive motivation, facilitation, self-regulation, and moral disengagement.[18] While this study functions within the framework of the three higher-level constructs, it is important to note that each of these sub-constructs are relevant to research aiming to describe and better understand sexual health.

Sub-Constructs of Social Cognitive Theory

Reciprocal Determinism. As noted, reciprocal determinism is based on the concept that environmental, personal, and behavioral factors are interrelated.[18] In the context of sexual health, this means that changes in sexual health education influence sexual health knowledge and self-efficacy; sexual health knowledge and self-efficacy influence sexual health behavior; and sexual health behavior influences sexual health knowledge, self-efficacy, and education. See Figure 2 as an example:

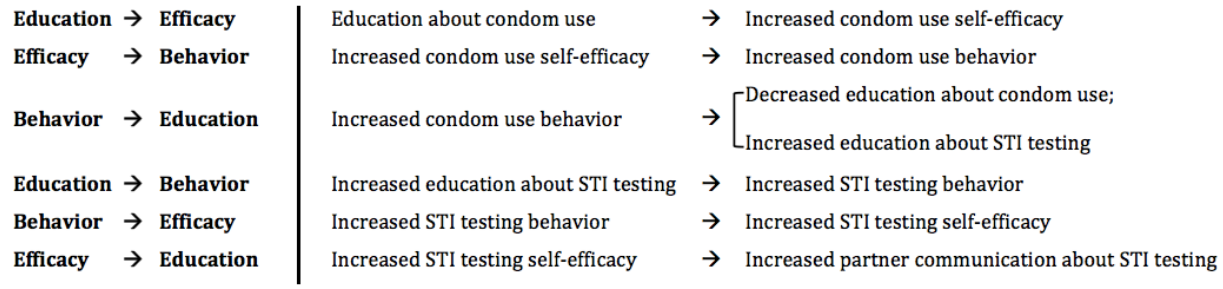

Figure 2. Fictional example of reciprocal determinism in sexual health

Outcome Expectations. Outcome expectations describe how individuals perceive the consequences and values of engaging in certain behaviors.[18] For example, an individual's outcome expectations regarding how their partner might react to a conversation about STI testing history or how comfortable they might feel asking a doctor or other healthcare provider for an STI test are both examples of how outcome expectations can influence self-efficacy, which may in turn affect an individual's decision to engage in one of these behaviors.

Self-Efficacy. As noted, self-efficacy indicates an individual's personal assessment of their ability to engage in a certain behavior.[18] For example, an individual who has low self-efficacy of using a condom correctly may avoid using condoms all together.

Collective Efficacy. Collective efficacy describes an individual's beliefs about a group's ability to perform a behavior that would lead to a desired outcome.[18] If a college student observes campus-wide efforts to promote STI testing, they may believe their community has high collective efficacy of STI testing. This may improve the individual's self-efficacy of STI testing because they see their peers also engaging in this behavior.

Observational Learning. Observational learning refers to learning to perform a behavior by being exposed to others engaging in that behavior.[18] For example, observing

conversations on television or in other media representations in which characters have comfortable and productive conversations about condom use before engaging in a sexual activity may encourage individuals to use condoms in their own lives.

Incentive Motivation. Incentive motivation refers to the utilization of rewards and punishments to modify individuals' behavior.[18] For example, healthcare providers may offer free condoms to individuals who get tested for STIs at their clinic to encourage both condom use and STI testing.

Facilitation. Facilitation describes the provision of tools, resources, or an environment that makes certain behaviors more amenable.[18] For example, implementing a college-wide course that educates students about productive partner communication may result in a campus community in which partner communication about condom use becomes easier and more prevalent.

Self-Regulation. Self-regulation refers to setting personal goals, rewards, instruction, and attaining social support to adhere to certain behaviors.[18] For example, an individual may challenge oneself to be STI tested every year and enlist a friend to keep them accountable.

Moral Disengagement. Moral disengagement refers to justifying why allowing a harmful behavior to continue may be acceptable based on individual moral standards.[18] For example, an individual may not support condom use because they believe individuals should not engage in sexual activity and if they do, being exposed to STIs is a justified consequence.

Each of these sub-constructs engages the three parts of the larger framework, explaining certain behaviors, affecting personal determinants, or suggesting ways in which

the environment influences personal and behavioral determinants. While some of this study's results may be explained by the sub-constructs described above, the study is designed to assess sexual health concepts within the larger framework of determinants.

Personal Determinants of Healthy Sexual Behavior

For this study, personal determinants refer to personal barriers to healthy sexual behavior, focusing on aspects of knowledge and self-efficacy that may inhibit condom use, STI testing, and partner communication among young adults. One over-arching barrier to adopting healthy sexual behaviors may be low STI risk perception. The National Longitudinal Study of Adolescent Health found that among STI-positive 18 to 26 year olds, 72% did not perceive themselves as being at risk for an STI.[19] Low risk perception may be indicative of gaps in STI-related knowledge, including misperceptions about STI transmission. A separate study found, for example, that 59% of university students did not believe oral sex counted as having "had sex."[20] A more recent study among a slightly older population corroborated this finding, with 42% of participants echoing this belief.[21] A lack of understanding of what constitutes "having sex" could affect an individual's perception of how to contract a "sexually transmitted" disease, which does include oral sex.

In addition to low risk perception, or low STI transmission knowledge, a 2004 study identified several barriers to STI testing, specifically, among 14-24 year olds.[22] These included cost, shame, and fear of loss of confidentiality of test results.[22] Being unable to pay for an STI test is arguably an environmental barrier; however, shame and fear of utilizing STI services are significant self-efficacy barriers to STI testing to note. In terms of condom use, negative views of condoms,[23] a desire for spontaneity,[23,24] a lack of condom use self-efficacy,[25] low relationship control,[25] and low partner familiarity[24] have been reported as

barriers. This indicates that self-efficacy of condom use as well as condom negotiation with unfamiliar partners appear to be barriers to using condoms.

In addition to knowledge and self-efficacy, partner communication is another likely factor affecting sexual health behavior. A 2002 study found that predictors of contraceptive use at first intercourse include communication about contraception before having sex.[5] This indicates that not only is knowing about and being comfortable with condoms important, but also being able to discuss their use with a partner.[5] In fact, studies examining whether being able to discuss safe sex with partners before engaging in sex have found that having these discussions may increase condom use, thus decreasing the likelihood of STI transmission.[26]

As discussed, research indicates that young adults have inadequate knowledge and may lack self-efficacy with regards to using condoms and being tested for STIs, but research encouragingly shows that communicating with partners about condoms and STI testing could positively affect their sexual health. Based on the literature, the personal determinants assessed in this study are condom use knowledge, condom use self-efficacy—specifically, feeling confident in one's ability to use a condom correctly—STI testing knowledge, STI testing self-efficacy, self-efficacy of partner communication about condom use, and self-efficacy of partner communication about STI testing. As suggested by reciprocal determinism, it should also be recognized that young adults' understanding and self-efficacy of sexual health is likely influenced by the sexual health education they receive from outside sources.

Environmental Determinants of Healthy Sexual Behavior

As noted, the educational environment in which young adults learn about sexual health can significantly influence their adopted behaviors. A 2009 study found that young people have five primary sources of sexual health education: friends, teachers, mothers, the media, and doctors.[27] This 2009 study also found that each source influenced adolescents' behavioral measures and beliefs in different ways.[27] A report by the Kaiser Family Foundation found that among teens aged 13-18 years, 61% received information about sexual health from friends, 44% from school-based sexual health education class, and 32% from parents.[28] Evidently, young adult sexual health education is a multi-faceted social system that affects sexual health behaviors in diverse ways. This study will focus on parents, friends, healthcare providers, school and organizational classes and programs (e.g., middle school, high school, college, religious), and the media as sources of sexual health education.

Sexual Health Education: Parents

Parents appear to be the most thoroughly-researched sexual health informants among adolescents. Multiple studies have found that mothers—more so than fathers—are typically the primary source of sexual health conversations for boys and girls.[29-31] However, gaps in the content of these conversations exist. One study reported multiple sexual health topics adolescents reported their parents are not very likely to talk about: over 25% of males and females reported that their mothers do not discuss safe sex, 33% of females reported that their mothers do not discuss contraception, and over 70% of males and females reported that neither parent talks about different types of sexual practices (e.g., oral sex).[30] These gaps appear to overlap with personal barriers of healthy sexual behavior,

including misperceptions about STI transmission and, presumably, condom use knowledge. With that said, the data show that the majority of participants did indicate that their mothers discussed safe sex and contraception with them.[30] Parents typically have access to a very direct line of communication with their children; therefore a better understanding of how their guidance can affect their children's sexual health could guide them towards more open and comprehensive sexual health conversations. Notably, the majority of teenagers in the above study indicated that sexual safety is the only topic they would want their parents to discuss.[32] This indicates that parents may have the most influence on addressing information about condom use knowledge and self-efficacy with their children. The results of this study could help verify this hypothesis.

Sexual Health Education: Peers

Peers perform a different kind of educational and supportive function when it comes to sexual health. Essentially, they fill in the content gaps that do not seem to be addressed by school or parental education. One study found that peers are responsible for sharing information about sex-related slang, non-intercourse sex (e.g., foreplay, oral sex, etc.) and ongoing social norms (e.g., how many people have had sex and at what age).[29] Interestingly, a meta-analysis of the literature found that compared to peer sexual attitudes and peer pressure to have sex, adolescent sexual behavior was most strongly associated with peer sexual behaviors.[33] This has significant implications on the overall educational context of sexual health. It implies that adolescents are more likely to engage in behaviors in which their peers are engaged, regardless of what their peers tell them to do or the social norms they adopt. By implementing peer-focused sexual health interventions centralized

around social groups and peer norms, it is possible that peer-influence could potentially be used to induce positive health behaviors among adolescents.

Sexual Health Education: Healthcare Providers

Receiving the least amount of research is the influence of physicians and other healthcare providers on adolescent sexual health. While adolescents most likely do not relate to their providers in the same way as with their parents or peers, healthcare providers are a rich source of medically accurate information regarding STIs and contraception. This expertise could be utilized to improve sexual health education from other educational sources. For example, Hassan et al. suggest that physicians could play a role in supplementing existing sexual health education by providing resources for and reviewing sexual health curricula.[34] Additionally, it has been suggested that healthcare providers may be in a position to facilitate sexual health conversations between patients and parents during medical visits as well as provide a third-party, objective space for support.[29,35] However, while the role of physicians in providing and supporting adolescent sexual health education seems promising, many physicians, particularly pediatricians, feel unprepared to counsel their adolescent patients about sexual health and have concerns about providing contraception.[34] For those who are comfortable, it appears that these conversations are restricted by time. A study by Alexander et al. found that 65% of adolescent medical visits had some sexual content included, but the average time for these conversations was only 36 seconds.[36] If young adults are found to be open to engaging in sexual health conversations with their healthcare providers, this may be an important avenue to improving sexual health that could be further explored.

Sexual Health Education: Schools

According to the Guttmacher Institute, sexual health education is geographically diverse and is significantly lacking in certain parts of the U.S. This is particularly true in the U.S. among the southern states:[a] only 44% of Southern states have mandatory sexual education that includes content about STIs, and less than 50% require sexual education that addresses contraception.[37] However, it should be noted that these regulations do not stipulate what cannot be taught, making it the school's prerogative to enhance this skeletal framework with richer conversations about STIs and condom use. Yet, according to a national study, it appears that many schools are not addressing these gaps. Students were asked what topics they felt they needed more information about from their sexual education classes: 51% wanted more information about how to get tested for HIV/AIDS and other STIs, 50% wanted more information on STIs other than HIV/AIDS, and 30% wanted more information about how to use condoms.[28] The data indicate that students recognize that they are lacking information about both knowledge and self-efficacy as they relate to condom use and STIs/STI testing. It is plausible that this lack of school-based information may contribute to the poor sexual health behaviors observed among the sexually active young adult population.

Sexual Health Education: College

As indicated above, young adults have a disproportionately high rate of STIs, and most are sexually active. Therefore, it is surprising that more research has not been

[a] These states are defined by the U.S. Census Bureau as the following: Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, and Texas

conducted on sexual health education on college campuses—formal or informal—and its effects. With that said, several research groups have taken steps to characterize sexual health on college campuses. Firstly, sexual health education and resources vary from campus to campus, much like they do across middle and high schools. Beginning in 2006, Trojan™ began conducting an annual Sexual Health report card that assesses colleges and universities' quality of sexual heath information and resources, contraceptive availability, on-site STI testing, and lecture/outreach programs, among other factors.[38] The report provides a ranking of 140 colleges and universities across the U.S. based on the sexual health resources they provide. The differences between the top 10 and the bottom 10 can be striking. For example, while the University of Georgia Health Center's, ranked number one, website includes resources including sexual decision making, "consent is sexy," STIs, and LGBTQ health,[39] it appears that only one[40] of the schools ranked in the bottom 10 includes any sexual health information on their health resource website beyond sexual assault and/or pregnancy. This indicates a wide disparity across college campuses that could represent a multitude of missed opportunities to provide impactful sexual health information to improve students' sexual health behaviors.

Additional studies have also been conducted in more targeted areas. For example, a 2012 study assessed colleges in Minnesota on sexual health resources and made comparisons across college characteristics, finding private schools and 4-year institutions provide more resources than public or 2-year institutions, respectively.[41] However, a follow-up study was reported in which the authors gathered student perspectives on the resources offered at their schools.[42] The top resources mentioned by students as being available at their college included condoms (88.5%), sexual health information (71.8%),

and friends (53.8%).[42] While sexual health information was listed as a top resource, qualitative feedback indicated that the information provided was not sufficient: "How easily a disease can be contracted, pregnancy, how safe a condom is…what brand should I use…what's the easiest STI to get. No one ever speaks up about that, but everyone's thinking about it."[42] Another student shared, "I guess I would like to see the university put more information out there. I'm not saying they're doing a bad job, but they could do a better job…[sic] It almost seems like they don't want to talk about it…"[42] Evidently, the students representing the schools in this study feel that colleges could be a valuable source of sexual health education, but that not enough is being done to capitalize on this potential. Based on this feedback, if sexual health education is to be implemented in colleges—based on student feedback—it is important to understand whether this education would be effective and on what topics it should focus.

Sexual Health Education: Religious

Notably, seven of the schools in the bottom ten of Trojan™'s Sexual Health Report Card are religious colleges or universities[38] and adhere to the common belief of many religions that individuals should abstain from sexual activity until marriage. While research has shown that young people who are religious are less likely to be sexually active than their less religious peers,[43] it has also been demonstrated that when these young people do become sexually active, they are less likely to use contraceptives.[44,45] A 2014 study found that church-going youth and adults believed that the church should have a more active role providing sexual health education resources, including coping with STIs and pregnancy.[46] Participants suggested making brochures about sexual health available and providing a question box for youth to submit anonymous questions.[46] For these participants, and likely

for many other individuals, the church is an important cornerstone in their lives; rather than viewing religion as a roadblock to sexual health, sexual health educators and advocates may benefit from viewing religious programs as an opportunity to reach a captive audience.

Sexual Health Education: Media

A national study of adolescents and young adults found that 72% indicated receiving sexual health education from TV shows or movies, magazines, or the Internet.[47] The extent to which young people utilize media to access information indicates a need to assess how effective this type of education truly is. A systematic review of the literature was conducted to assess the effectiveness of social media and text messaging interventions that aimed to increase STI knowledge and testing, decrease risky sexual behavior, and reduce STI incidence among young adults 15-24 years old.[48] The results showed that social media and text messaging can increase knowledge of STI prevention and social media/text messaging interventions can also affect behavior, including STI testing; however, the article also notes that evidence regarding behavior is weak.[48] A similar study in the UK also found that interactive digital interventions have positive effects on sexual health knowledge, as well as behavior, but did not significantly impact safer sex intention.[49] A 2014 study took a slightly different approach, assessing how comfortable young people feel accessing sexual health information through these channels.[50] Interestingly, the study found differences based on the type of media: 85% of respondents aged 16 to 29 years old reported they would be comfortable accessing sexual health information from websites, while less reported feeling comfortable accessing this information via social media (52% from Facebook, 51% from apps, 44% from SMS, and 36% from Twitter).[50] Based on the

literature, it appears that in addition to better understanding the types of media to which young adults are most receptive, it is also important to assess what specific information can be provided via media to have the greatest impact on improving sexual health behaviors.

Gaps in the Literature

As evidenced above, multiple studies have assessed sexual health education sources independently or in limited combinations. However, to date, all of the specified sources (parents, friends, healthcare providers, schools, college, religious class or programs, and the media) have not been assessed in terms of their relation to condom use, STI testing, and partner communication knowledge, self-efficacy, and behavior together in a single study of young adults. This information could guide the development of sexual health education resources that are tailored for multiple different sources. For example, guides that aid parents in educating their children on sexual health topics they are most receptive to hearing or trainings that prepare healthcare providers to share valuable sexual health information with their young adult patients. Additionally, school-based sexual health education is especially lacking in the Southern U.S.,[37] yet there is a dearth of literature focusing on this region directly. While this study will not be limited to the Southern U.S., geographical information will be collected for making regional comparisons.

Research Questions & Hypotheses

By utilizing the constructs and framework of the SCT, this study sought to assess personal and environmental factors that may influence the sexual health behaviors of sexually active young adults in the U.S. The following research questions were asked:

Research Question 1: To what extent are sexual health education source and number of sexual health education sources associated with sexual health knowledge and self-efficacy? Additionally, to what extent is the number of sexual health education sources associated with sexual health behavior?

Hypothesis 1a. More sexual health education sources would have a significant association on sexual health knowledge than on sexual health self-efficacy. This is because, according to the literature, knowledge appears to be noted most frequently as being affected by sexual health education as opposed to efficacy.[28,30,42,48,49]

Hypothesis 1b. Education from parents would have a significant association with both condom use knowledge and condom use self-efficacy. This is based on youth feedback that the majority of their mothers discuss safe sex and contraception.[30]

Hypothesis 1c. Education from college classes or programs would be significantly associated with STI knowledge. This prediction was based on research finding that college students reported learning about STIs from resources on campus.[42]

Hypothesis 1d. No relationship would be observed between education from a healthcare provider and condom use knowledge or self-efficacy. This prediction was made because research has shown that some healthcare providers may feel uncomfortable discussing sexual health with adolescents or providing them with contraceptives.[34]

Hypothesis 1e. Education from a healthcare provider would be significantly associated with STI testing knowledge because those who receive STI testing receive this testing from a healthcare provider.

Hypothesis 1f. Education from classes or programs in middle or high school would be significantly associated with STI testing knowledge, condom use knowledge, and condom use self-efficacy. This is because while students indicate wanting more information about STI testing and condom use, research shows that they are receiving some degree of education on these topics.[28]

Hypothesis 1g. Education from media would be significantly associated with both condom use and STI testing knowledge. Research shows that media can improve knowledge of STI prevention.[48,49]

Hypothesis 1h. The number of sexual health education sources would be significantly associated with sexual health knowledge, self-efficacy, and behavior. If more sources reinforce important facts about sexual health participants, may be more likely to retain this information. Additionally, if more sources focus on empowering young adults to feel confident in their sexual health-related abilities, this positive reinforcement may increase young adults' self-efficacy. As a result, participants could demonstrate more positive sexual health behaviors.

Literature regarding friends and sexual health education found that education from friends could influence behavior;[33] however, little was said about the influence of education from friends on knowledge or self-efficacy and therefore no predictions could be made for education from friends. Research on education from religious classes and programs has found that most religious teachings do not address condom use or STI testing.[46] Therefore, no predictions were made on its effects on sexual health knowledge or self-efficacy either.

Research Question 2: To what extent are sexual health knowledge, self-efficacy, education source, and education temporality—meaning whether the education was received before or after first sexual encounter—associated with young adults' sexual health behavior?

Hypothesis 2a. STI testing knowledge—specifically about risky behaviors—would be significantly associated with STI testing behavior. According to the literature, young adults may not be getting STI tested due to low risk perception.[19-21]

Hypothesis 2b. STI testing self-efficacy would be significantly associated with STI testing behavior. Research has shown that shame around being STI tested may be a barrier to STI testing[22] and shame may lead to decreased STI testing self-efficacy.

Hypothesis 2c. Condom use self-efficacy would be significantly associated with condom use behavior. A lack of condom use self-efficacy[25] has been cited as a barrier to condom use.

Hypothesis 2d. Self-efficacy of partner communication about condom use would be significantly associated with condom use behavior as well as partner communication behavior. Research has shown that partner communication about contraceptives before first sexual encounter is associated with use of contraceptives.[5]

Hypothesis 2e. Education from friends would be significantly associated with condom use, STI testing, and partner communication behavior. Literature on sexual health education found that young adults are influenced by and likely to mimic the sexual health behaviors of their peers.[33]

Hypothesis 2f. Education from a healthcare provider would be significantly associated with STI testing behavior. As noted in the hypothesis for Research Question 1, those who are tested for STIs are likely to engage in a conversation about STIs with a healthcare provider.

Hypothesis 2g. Education from the media would be significantly associated with STI testing and condom use behavior, associations supported by the literature.[48,49]

No predictions were made for temporality of other types of education on sexual health behavior.

Exploratory Aim: Do differences in sexual health knowledge, self-efficacy, behavior, educational source, and/or education temporality exist between individuals from the Southern U.S. vs. other areas of the U.S.?

Hypotheses 1a, 1b. Those from the Southern U.S. may have significantly lower STI testing and condom use knowledge than those not from the Southern U.S. This prediction was made because most state sexual health education policies in the Southern U.S. do not mandate content about STIs or contraception.[37] Additionally, because of these educational policies, it was predicted that those from the Southern U.S. would indicate having significantly less education from classes or programs in middle or high school.

Methods

Study Design

This was a cross-sectional study of young adults that assessed their sexual activity and condom use, STI testing, and partner communication knowledge, self-efficacy, and sexual health education exposures. Participants completed an anonymous online survey created using *SurveyMonkey* (Appendix A). The Emory University Institutional Review Board approved this study. No incentive was offered for participation. Data collection took place from August 2016 to December 2016.

Study Participants

Participants were recruited through convenience and snowball sampling via social media, specifically *Facebook* and *GroupMe*. A link to the survey was posted on the PI's personal profiles and affiliated college *Facebook* pages. Participants were asked to share the link with other members of their social groups and on their own college *Facebook* pages. Eligible participants were between 18-24 years old, had ever participated in oral, vaginal, or anal sex, and attended high school in the United States. Of 401 individuals who

began the survey, 272 were eligible and participated, yielding a response rate of 67.8%. Participants provided consent by reading the consent form online, prior to beginning the survey, and selecting "yes" if they read the consent form and agreed to participate in the study; selecting “no” closed the survey and they were unable to proceed.

Measures

The variables collected in this study encompassed the three major constructs of social cognitive theory: personal determinants, behavioral determinants, and environmental determinants. Participant demographics were also collected. Personal determinants were measured by assessing condom use and STI testing knowledge and self-efficacy and self-efficacy of partner communication about condom use and STI testing. Behavioral determinants assessed participants’ condom use, STI testing, and partner communication behaviors. Environmental determinants were measured by investigating condom use, STI testing, and partner communication education source and temporality. Perceived partner communication education effectiveness was also measured. "STD" instead of "STI" was used throughout the survey, as “STD” is a term with which participants may be more familiar. Participants could skip any non-eligibility questions and could select “Prefer not to answer” as an answer choice for most questions.

Participant Demographics

Participant demographics included participants’ self-reported age, state in which they completed the majority of middle and high school, gender (female, male, transgender, other), ethnicity (yes/no Hispanic or Latino), and race (White, Black/African-American, Asian, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Other). Participants were asked to indicate in what state they attended the majority of middle and

high school in order to characterize their sexual health education background based on publically available state sexual education policy. This variable was recoded into a new variable in which 0=not Southern U.S. and 1=Southern U.S. Participants who indicated completing the majority of middle and high school in Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, or Texas were included in the "Southern U.S." group and all other participants were included in the "not Southern U.S." group.

Additional variables about sexual activity and sexual history were also collected. These were sexual activity (oral sex, vaginal sex, anal sex, I have not participated in any of these sexual activities), sexual preference (exclusively men, exclusively women, both men and women, other), age when first had vaginal sex, multiple sexual partners in lifetime (yes, no), multiple sexual partners in the past 12 months (yes, no), use of birth control other than condoms (yes, no), and STI history (yes, no, I don't know/I don't remember). Use of birth control other than condoms was asked because while other forms of birth control do not protect against STIs, using a form of birth control other than condoms may affect condom use behavior independent of education, knowledge, or self-efficacy. Participants were asked about their broader sexual activity and STI history to contextualize data gathered on condom use and STI testing behavior.

Personal Determinants

The following personal determinants were measured: condom use self-efficacy, condom use knowledge, STI testing self-efficacy, STI testing knowledge, self-efficacy of partner communication about condom use, and self-efficacy of partner communication

about STI testing. Self-efficacy questions were asked prior to knowledge questions to mitigate feelings of false confidence after reading facts about condom use and STIs.

Condom Use Self-Efficacy

Condom use self-efficacy was measured using a validated 3-item subscale[51] of the Condom Use Self-Efficacy Scale.[52] These items were scored on a 5-point Likert scale, in which 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree. The statements are as follows: "I feel confident in my ability to put a condom on myself or my partner(s)," "I feel confident in my ability to use a condom correctly," and "I feel confident in my ability to put a condom on myself or my partner(s) quickly." The scores for each item were summed for a total condom use self-efficacy score, which could range from 5 to 15, with higher scores indicating higher self-efficacy (α=.914).

Condom Use Knowledge

Condom use knowledge was measured using the question, "Which of the following offers the best protection against STDs?"[51] with the following answer choices: latex condoms, pulling out, hormonal birth control, and don't know. The original question indicated that in addition to "latex condoms," "distractor" answer choices were included, but did not specify these distractors. Therefore, the additional answer choices were self-created based on common terms and contraceptive methods used among young adults. This item was recoded into two groups: 1=know latex condoms offer the best protection against STDs (if the participant selected "latex condoms") and 0=does not know latex condoms offer the best protection against STDs (if the participant selected any answer other than latex condoms).

STI Testing Self-Efficacy

STI testing self-efficacy was measured using one item from a validated 5-item scale: "I feel confident that I can ask my doctor or healthcare provider for STD testing."[53] The wording of this statement was slightly modified from ,"I feel confident I could ask my doctor or health-care provider for STI testing" for tense and language consistency. This item was scored on a 5-point Likert scale, in which 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree.

Partner Communication Self-Efficacy

Self-efficacy of partner communication about STI testing was measured using another single item from the 5-item scale: "I feel confident that I can ask my partner(s) to get tested for STDs."[53] The wording of this statement was slightly modified from, "I feel confident I could ask my partner to get tested for STIs" for tense consistency and acknowledgement of multiple partners. Only two items from this 5-item scale were used because two questions asked specifically about HIV and this study does not make a distinction between HIV and STIs. The fifth item assessed an individual's ability to tell a partner if they have an STI. However, this study sought to assess an individuals' ability to ask their partner about their status rather than share their own. Self-efficacy of partner communication about condom use was measured using a modification of the above efficacy statement: "I feel confident that I can ask my partner(s) to use a condom." Both items were scored on a 5-point Likert scale, in which 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree.

STI Testing Knowledge

STI testing knowledge was measured using a validated 6-item scale (α=0.914). Each of the following items was a response to the statement, "I think the following people should get STD tested": people who have only one sexual partner, people who have had multiple sexual partners in their life, people who have multiple sexual partners at the same time, people who have sexual intercourse, people who have oral sex, and people who have anal sex. The items were scored dichotomously as 1=selected and 0=not selected. The scores for each item were summed and total scores could range from 0 to 6, with higher scores indicating higher STI testing knowledge. The following question from the *Kaiser Family Foundation National Survey of Adolescents and Young Adults* was also used to measure STI testing knowledge: "For each of the following [kissing, oral sex, sexual intercourse, anal sex], please tell me if you can get an STD this way or not."[47] "Anal sex" was not included in the original question, but is relevant to the comprehensive nature of this study. These items were scored dichotomously as 1=selected and 0=not selected. The scores for each item were summed and total scores could range from 0-4, with higher scores indicating higher STI testing knowledge. The Cronbach's alpha for this scale was 0.702. Because the Cronbach's alpha for the first scale was higher, the first scale was utilized in all analyses involving STI testing knowledge.

Behavioral Determinants

Condom use, STI testing, and partner communication behavior were measured using select questions from the *Kaiser Family Foundation National Survey of Adolescents and Young Adults.*[47]

Condom Use Behavior

Condom use was measured using the question, "In general, when you have [oral sex, vaginal sex, anal sex], how often do you use a condom?" The original question asked only about "sexual intercourse;" however, understanding condom use for each sexual activity is relevant to the comprehensive nature of this study. To accomplish this, the question was split into three separate items, one for each type of sex. For example, the question about oral sex read as, "In general, when you give/receive oral sex, how often do you use a condom?" This item was scored on a 4-point Likert scale in which 1=never, 2=some of the time, 3=most of the time, 4=all of the time. Additionally, participants could select "Prefer not to answer" or "I have never participated in this activity."

STI Testing Behavior

STI testing behavior was measured using the question, "Have you ever been tested for STDs other than HIV?"[47] modified in the survey to read as, "Have you ever been tested for STDs?" to avoid excluding HIV testing. This item was scored dichotomously as 0=no and 1=yes. Participants could also select "I don't remember" or "Prefer not to answer."

Partner Communication Behavior

Partner communication about condom use was measured using the question, "Have you ever talked to your partner about using condoms?"[47] In order to assess frequency, this question was modified to read, "In general, how often do you talk to your partner(s) about using condoms?" And was scored on a 4-point Likert scale in which 1=never, 2=some of the time, 3=most of the time, and 4=all of the time. Participants could also select "Prefer not to answer." Partner communication about STI testing was measured by the question, "Have you ever talked to your partner about STDs other than HIV?"[47] However, to more

specifically address testing behavior and avoid excluding HIV testing, this question was modified to read as, "Have you ever asked your partner(s) if they have ever been tested for STDs?" This item was scored so that 0=no and 1=yes. Participants could also select “I don’t remember” or “Prefer not to answer.”

Environmental Determinants

Education Source

Sexual health education source was measured using modified questions from the *Kaiser Family Foundation National Survey of Adolescents and Young Adults.*[47] Three types of sexual health education were assessed: using condoms, STI testing, and talking to sexual partner(s) about sexual health (condoms or STI testing). The following sources were provided as options: my parents or another trusted adult, my friends, my doctor or other healthcare provider, a class or program in middle or high school, a class or program in college, a religious class or program, media (e.g., Internet, TV, radio), I have never learned something helpful about [insert education type] from anybody, and other. These sources were modified from the options given by the *Kaiser Family Foundation* based on the literature supporting this study. Participants were given a statement for each education type (e.g., “I have learned something helpful about using condoms from”) and were instructed to select each source that provided education to them about that topic. Each source for each education type was assessed as an individual item and scored dichotomously as 0=not selected and 1=selected. The original items were not scored dichotomously; they measured amount of education, and used a 4-point Likert scale for each source. This information was outside of the scope of this study, and therefore the indicated modification was made to the survey questions.

Aggregate variables were created to assess the number of education sources that taught participants about each sexual health topic. For example, the number of sources participants selected receiving condom use education from (1=selected) was summed to create an aggregate condom use education variable with a value ranging from 0 to 7.

Education Temporality

Sexual health education temporality assessed whether education occurred before or after the participant's first sexual encounter. After selecting all of the sources from which they received a certain type of sexual health education, participants were presented with the following question: "Did you learn about [insert education type] from these sources before or after the first time you had sex? The sources from which participants indicated receiving that type of education were listed and for each one, participants could select 0=before, 1=after, or "I don't remember."

Partner Communication Education Effectiveness

Perceived effectiveness of received partner communication education was measured similarly to temporality. These items assessed whether or not participants felt more comfortable talking to their partners about sexual health after receiving education on partner communication. After selecting all of the sources from which they received education on partner communication, participants were presented with the question: "Did learning about talking to your sexual partner(s) from these sources make you feel more comfortable talking to your sexual partner(s) about sexual health?" The sources from which participants indicated receiving that type of education were listed and for each one, participants could select 0=no, 1=yes, or "I don't remember."

Analysis

Survey responses were imported from *SurveyMonkey* to *SPSS*. For all non-demographic questions, the answer choice "Prefer not to answer" was coded as missing. For all behavior questions, the answer choices "I have never participated in this activity" and "I don't remember" were coded as missing. For all education questions, the answer choice "I don't remember" was coded as missing. Short answer "other" responses were also available for some questions. However, few participants submitted short answer "other" responses, therefore these were not included in this analysis.

As noted, condom use behavior was assessed for three different types of sexual activities: oral, vaginal, and anal sex. Therefore, all analyses assessing condom use behavior were conducted for condom use during each type of sexual activity. Before running each test, the sample was filtered to only include participants who had ever engaged in that sexual activity in the analysis. For example, before conducting a test assessing condom use behavior during oral sex, the sample was filtered to only include participants who had ever participated in oral sex.

As indicated, reliability testing was conducted on the condom use self-efficacy and STI knowledge scales. Univariate analyses were conducted for all variables to gather descriptive statistics on all of the study data. Bivariate and multivariate analyses were conducted to address the study questions. All analyses were conducted using a 95% confidence interval. All ordinal variables were treated as continuous for analysis and were not assessed for normality.

Research Question 1: To what extent are sexual health education source and number of sexual health education sources associated with sexual health knowledge and self-efficacy? Additionally, to what extent is the number of sexual health education sources associated with sexual health behavior?

Chi-square analyses were conducted to assess associations between condom use education source and condom use knowledge, while independent samples t-tests were conducted to assess associations between condom use education source and condom use self-efficacy. Independent samples t-tests were conducted to assess associations between STI testing education source and STI testing knowledge and STI testing education source and STI testing self-efficacy. Independent samples t-tests were also conducted to assess associations between source of education on partner communication and self-efficacy of partner communication about condom use, and source of education on partner communication and self-efficacy of partner communication about STI testing.

To assess associations between number of sexual health education sources with personal and behavioral determinants, independent samples t-tests were conducted between each aggregate variable and condom use knowledge, STI testing behavior, and partner communication about STI testing behavior. Pearson's R correlational analyses were conducted between each aggregate variable and STI testing knowledge, condom use self-efficacy, STI testing self-efficacy, self-efficacy of partner communication about condom use and about STI testing, condom use behavior during oral, vaginal, and anal sex, and partner communication about condom use behavior.

Research Question 2: To what extent are sexual health knowledge, self-efficacy, education source, and education temporality associated with young adults' sexual health behavior?

Bivariate Analysis: Condom Use Behavior

Pearson's R correlational analyses were conducted to assess associations between condom use behavior and condom use self-efficacy, STI testing knowledge, STI testing self-efficacy, self-efficacy of partner communication about condom use, and self-efficacy of partner communication about STI testing. Independent samples t-tests were conducted to assess associations between condom use behavior and condom use knowledge, condom use education source, and temporality of condom use education.

Bivariate Analysis: STI Testing Behavior

Independent samples t-tests were conducted to assess associations between STI testing behavior and condom use self-efficacy, STI testing knowledge, STI testing self-efficacy, self-efficacy of partner communication about condom use, and self-efficacy of partner communication about STI testing. Chi-square analyses were conducted to assess associations between STI testing behavior and condom use knowledge, STI testing education source, and STI testing education temporality.

Bivariate Analysis: Partner Communication about Condom Use Behavior

Pearson’s R correlational analyses were conducted to assess associations between partner communication about condom use behavior and condom use self-efficacy, STI testing knowledge, STI testing self-efficacy, self-efficacy of partner communication about condom use and self-efficacy of partner communication about STI testing. Independent samples t-tests were conducted to assess associations between partner communication about condom use behavior and condom use knowledge, partner communication education source, and temporality of partner communication education.

Bivariate Analysis: Partner Communication about STI Testing Behavior

Independent samples t-tests were conducted to assess associations between partner communication about STI testing behavior and condom use self-efficacy, STI testing knowledge, STI testing self-efficacy, self-efficacy of partner communication about condom use, and self-efficacy of partner communication about STI testing. Chi-square analyses were conducted to assess associations between partner communication about STI testing behavior and condom use knowledge, STI testing education source, and STI testing education temporality.

Multivariate Analysis

To assess the relative effects of knowledge, self-efficacy, education source, and education temporality on each sexual health behavior, a series of multiple linear and multiple logistic regressions were conducted. Multiple linear regressions were conducted for tests in which the outcome variable was condom use behavior or partner communication about condom use behavior, and multiple logistic regressions were conducted for tests in which the outcome variable was STI testing behavior or partner communication about STI testing behavior.

Predictor variables for each regression were knowledge, self-efficacy, education source, and education temporality variables that were significantly associated with the outcome variable at the $p<.05$ level in bivariate analyses. If this association was assessed using chi-square analysis, associations were considered significant for this analysis only if all cell counts were more than 5.

To account for demographic variables that the literature suggests may influence sexual health behavior, bivariate analyses were conducted between gender and race and

each outcome variable. Gender and race were included in models as independent variables if they were associated with the outcome variable at the p<.2 level. Dummy coding was conducted for race; the dummy variables included one for Black/African-American and one for Asian, with White serving as the reference group for both dummy variables. Sexual preference, geography, birth control use, and STI history were also included as independent variables if they were associated with the outcome variable at the p<.2 level. Dummy coding was conducted for sexual preference; the dummy variables included one for both men and women and one for exclusively women, with exclusively men serving as the reference group for both dummy variables.

Bivariate correlational analyses were conducted between all predictor and all potential demographic variables for each model to test for colinearity. It is expected that some variables may be correlated; however, because the variables draw from different constructs of SCT and do not intentionally measure the same things, only r-values greater than .5 were considered for exclusion from the model. In the case that an outcome variable was significantly associated with an education source variable and its corresponding temporality variable, the model was run only with the education source variable. The models were run using the enter method, with all independent variables input into the model at once.

Exploratory Aim: Do differences in sexual health knowledge, self-efficacy, behavior, educational source, and/or education temporality exist between individuals from the Southern U.S. vs. other areas of the U.S.?

Chi-Square analyses were conducted to assess associations between geography and sexual activity, number of lifetime partners, number of partners in the past 12 months,

birth control use, and STI history. An independent samples t-test was conducted to assess associations between geography and age at first time having vaginal sex.

A chi-square analysis was conducted to assess the association between geography and condom use knowledge and an independent samples t-test was conducted to assess the association between geography and STI testing knowledge.

Independent samples t-tests were conducted to assess associations between geography and condom use self-efficacy, STI testing self-efficacy, self-efficacy of partner communication about condom use, and self-efficacy of partner communication about STI testing.

Independent samples t-tests were conducted to assess associations between geography and condom use behavior and partner communication about condom use behavior. Chi-square analyses were conducted to assess associations between geography and STI testing behavior and partner communication about STI testing behavior.

Chi-square analyses were conducted to assess associations between geography and condom use education source, condom use education temporality, STI testing education source, STI testing education temporality, partner communication education source, and partner communication education temporality.

Results

Participant Demographics

All participant demographics are presented in Table 1. A total of 272 eligible individuals participated in this study. The average age of the participants was 22.32 (sd=1.41) and the majority of participants were female (n=225, 82.7%), not Hispanic or Latino (n=233, 85.7%), white (n=189, 69.5%), and from the Southern U.S. (n=168, 61.8%).

Nearly all participants had engaged in oral sex (n=268, 98.5%), most had participated in vaginal sex (n=233, 85.7%), and less than a quarter had participated in anal sex (n=62, 22.8%). Most participants had sex exclusively with men (n=203, 76.6%), had more than one sexual partner in their lifetime (n=188, 70.9%), and had not had more than one sexual partner in the past 12 months (n=186, 70.2%). Of those participants who had participated in vaginal sex, the average age of their first sexual encounter was 18.44 (sd=2.27). Most participants or participants' partners used birth control other than condoms (n=175, 66%) and most had never had an STI (n=240, 90.6%).

Table 1. Participant Demographics

Variable	Mean (sd) or n (%)
Age	22.32 (1.41)
Gender	
Female	225 (82.7%)
Male	42 (15.4%)
Transgender	0 (0%)
Other	2 (0.7%)
Ethnicity	
Hispanic/Latino	38 (14%)
Not Hispanic/Latino	233 (85.7%)
Race	
White	189 (69.5%)
Black/African-American	27 (9.9%)
Asian	30 (11.0%)
Native Hawaiian or Pacific Islander	1 (0.4%)
American Indian or Alaska Native	0 (0%)
Other	15 (5.5%)
Sexual Activity	
Ever participated in oral sex	268 (98.5%)
Ever participated in vaginal sex	233 (85.7%)
Ever participated in anal sex	62 (22.8%)
Age when first had Vaginal Sex	18.44 (2.27)
Sexual Partners	
Exclusively Men	203 (76.6%)
Exclusively Women	36 (13.6%)
Both Men and Women	24 (9.1%)
More than one sexual partner in lifetime	
Yes	188 (70.9%)

No	77 (29.1%)
More than one sexual partner in past 12 months	
Yes	79 (29.8%)
No	186 (70.2%)
Participant or participants' partner use birth control other than condoms	
Yes	175 (66%)
No	87 (32.8%)
Ever had an STD	
Yes	19 (7.2%)
No	240 (90.6%)

Personal Determinants

Condom Use Self-Efficacy

Most participants (n=201, 77%) reported that they feel confident in their ability to put a condom on themselves or their partner (Table 2). Most (n=214, 82%) reported feeling confident in their ability to use a condom correctly, and about half (n=144, 55.2%) reported feeling confident in their ability to put a condom on themselves or their partner quickly (Table 2). Condom use self-efficacy scores ranged from 7 to 15 and the average score was 12.91 (sd=1.90).

STI Testing Self-Efficacy

Most participants (n=198, 76.2%) agreed or strongly agreed that they feel confident that they can ask their doctor or healthcare provider for STI testing (Table 2). The average STI testing self-efficacy score was 4.38 (sd=0.82).

Self-efficacy of Partner Communication about Condom Use

Nearly all participants (n=236, 90.8%) agreed or strongly agreed that they feel confident that they can ask their partner(s) to use a condom (Table 2). The average self-efficacy of partner communication about condom use score was 4.51 (sd=0.75).

Self-efficacy of Partner Communication about STI Testing

Nearly all participants (n=198, 76.2%) agreed or strongly agreed that they feel confident that they can ask their partner(s) to get STI tested (Table 2). The average self-efficacy of partner communication about STI testing was 4.02 (sd=1.00).

Table 2. Self-Efficacy

Strongly Disagree (1) n (%)	Disagree (2) n (%)	Neither Agree nor Disagree (3) n (%)	Agree (4) n (%)	Strongly Agree (5) n (%)
I feel confident in my ability to put a condom on myself or my partner(s).				
7 (2.7%)	27 (10.3%)	26 (10.0%)	89 (34.1%)	112 (42.9%)
I feel confident in my ability to use a condom correctly.				
5 (1.9%)	12 (4.6%)	30 (11.5%)	89 (34.1%)	125 (47.9%)
I feel confident in my ability to put a condom on myself or my partner(s) quickly.				
12 (4.6%)	51 (19.5%)	54 (20.7%)	71 (27.2%)	73 (28.0%)
I feel confident that I can ask my partner(s) to use a condom.				
0 (0.0%)	8 (3.1%)	16 (6.2%)	71 (27.3%)	165 (63.5%)
I feel confident that I can ask my partner to get tested for STDs.				
4 (1.5%)	23 (8.8%)	35 (13.5%)	100 (38.5%)	98 (37.7%)
I feel confident that I can ask my doctor or healthcare provider for STD testing.				
2 (0.8%)	10 (3.8%)	14 (5.4%)	95 (36.5%)	139 (53.5%)

Condom Use Knowledge

The majority of participants (n=232, 89.9%) knew that latex condoms offer the best protection against STIs. 9.3% (n=24) believed hormonal birth control offers the best protection, no participants believed the withdrawal method offers the best protection against STIs, and 0.8% (n=2) did not know.

STI Testing Knowledge

Nearly half of the participants (n=122, 44.9%) knew that STIs can be transmitted by kissing, 94.5% (n=257) knew STIs can be transmitted by giving or receiving oral sex, 94.5%

(n=257) knew STIs can be transmitted by having vaginal sex, 92.6% (n=252) knew STIs can be transmitted by having anal sex, and 1 (0.4%) participant did not think STIs could be transmitted by participating in any of these activities (Table 3).

Most participants (n=204, 75%) knew that those who have only one sexual partner should get STI tested, 93% (n=253) knew that people who have had multiple sexual partners in their life should get STI tested, 93.8% (n=255) knew that people who have multiple sexual partners at the same time should get STI tested, 84.2% (n=229) knew that people who have sexual intercourse should get STI tested, 81.6% (n=222) knew people who have oral sex should get STI tested, and 84.2% (n=229) knew people who have anal sex should get STI tested (Table 3). No participants disagreed that people engaging in at least one of these activities should get STI tested. STI testing knowledge scores ranged from 0 to 6, with an average score of 5.12 (sd=1.75).

Table 3. STI Knowledge

Item	Yes n (%)	No n (%)
I think you can get an STD by kissing.	122 (44.9%)	150 (55.1%)
I think you can get an STD by giving or receiving oral sex.	257 (94.5%)	15 (5.5%)
I think you can get an STD by having vaginal sex.	257 (94.5%)	15 (5.5%)
I think you can get an STD by having anal sex.	252 (92.6%)	20 (7.4%)
I think people who have only one sexual partner should get STD tested.	204 (75.0%)	68 (25.0%)
I think people who have had multiple sexual partners in their life should get STD tested.	253 (93.0%)	19 (7.0%)
I think people who have multiple sexual partners at the same time should get STD tested.	255 (93.8%)	17 (6.3%)
I think people who have sexual intercourse should get STD	229 (84.2%)	43 (15.8%)
I think people who have oral sex should get STD tested.	222 (81.6%)	50 (18.4%)
I think people who have anal sex should get STD tested.	229 (84.2%)	43 (15.8%)

Behavioral Determinants

Condom Use Behavior

The majority of participants (n=229, 92%) never use a condom when they give/receive oral sex (Table 4). The average condom use frequency during oral sex score was 1.09 (sd=0.34). Just over half of participants (n=113, 60.4%) use a condom all or most of the time when they have vaginal sex (Table 4). The average condom use frequency during vaginal sex score was 2.76 (sd=1.16). Less than half of participants (n=30, 42.4%) use a condom all or most of the time when they have anal sex (Table 4). The average condom use frequency during anal sex score was 0.64 (sd=0.48).

STI Testing Behavior

Most participants (n=149, 59.8%) had ever been tested for STIs.

Partner Communication about Condom Use Behavior

Less than half of participants (n=121, 49.2%) responded that they talk to their partner(s) about using condoms all or most of the time (Table 4). The average partner communication about condom use score was 2.65 (sd=1.08).

Partner Communication about STI Testing

Most participants (n=154, 64.2%) had asked their partner(s) if they had ever been tested for STIs.

Table 4. Condom Use Behavior and Partner Communication			
Never (1) n (%)	**Some of the Time (2) n (%)**	**Most of the Time (3) n (%)**	**All of the Time (4) n (%)**
In general, when you give/receive oral sex, how often do you use a condom?			
229 (92.0%)	18 (7.2%)	1 (0.4%)	1 (0.4%)
In general, when you have vaginal sex, how often do you use a condom?			
46 (20.9%)	41 (18.6%)	52 (23.6%)	81 (36.8%)
In general, when you have anal sex, how often do you use a condom?			
31 (47.0%)	7 (10.6%)	7 (10.6%)	21 (31.8%)
In general, how often do you talk to your partner(s) about using condoms?			
38 (15.4%)	87 (35.4%)	45 (18.3%)	76 (30.9%)

Environmental Determinants

Condom Use Education

When indicating sources from whom they learned something helpful about using condoms, 16.9% (n=46) selected their parents or another trusted adult, 48.9% (n=133) selected their friends, 35.7% (n=97) selected their doctor or other healthcare provider, 49.3% (n=134) selected a class or program in middle or high school, 32% (n=87) selected a class or program in college, 0.7% (n=2) selected a religious class or program, and 58.1% (n=158) selected the media (e.g., Internet, TV, radio) (Table 5). 3.7% (n=10) had never learned something helpful about using condoms from anybody.

Of those participants who learned something helpful about condom use from these sources, 95.3% (n=41) of participants who learned something from their parents or another trusted adult received this education before their first sexual encounter (See Table 5). Likewise, 88.3% (n=106) of those who learned from their friends, 60.5% (n=52) of those who learned from their doctor or other healthcare provider, 96.2% (n=126) of those who learned from a class or program in middle or high school, 68.7% (n=57) of those who

learned from a class or program in college, 100% (n=2) of those who learned from a religious class or program, and 81.7% (n=125) of those who learned form the media (e.g., Internet, TV, radio) also received this education before their first sexual encounter (Table 5).

Table 5. Condom Use Education Source and Temporality

Source	Received n (%)	Not Received n (%)
Parents or another trusted adult	46 (16.9%)	226 (83.1%)
Before first sexual encounter	41 (95.3%)	
After first sexual encounter	2 (4.7%)	
Friends	133 (48.9%)	139 (51.1%)
Before first sexual encounter	106 (88.3%)	
After first sexual encounter	14 (11.7%)	
Doctor or other healthcare provider	97 (35.7%)	175 (64.3%)
Before first sexual encounter	52 (60.5%)	
After first sexual encounter	34 (39.5%)	
A class or program in middle or high school	134 (49.3%)	138 (50.7%)
Before first sexual encounter	126 (96.2%)	
After first sexual encounter	5 (3.8%)	
A class or program in college	87 (32.0%)	185 (68.0%)
Before first sexual encounter	57 (68.7%)	
After first sexual encounter	26 (31.1%)	
A religious class or program	2 (0.7%)	270 (99.3%)
Before first sexual encounter	2 (100.0%)	
After first sexual encounter	0 (0.0%)	
Media (e.g., Internet, TV, radio)	158 (58.1%)	114 (41.9%)
Before first sexual encounter	125 (81.7%)	
After first sexual encounter	28 (18.3%)	

STI Testing Education

When indicating sources from whom they learned something helpful about STI testing, 19.1% (n=52) selected their parents or another trusted adult, 44.5% (n=121) selected their friends, 59.6% (n=162) selected their doctor or other healthcare provider, 50.4% (n=137) selected a class or program in middle or high school, 39.7% (n=108)

selected a class or program in college, 1.5% (n=4) selected a religious class or program, and 53.7% (n=146) selected the media (e.g., Internet, TV, radio) (Table 6). 2.6% (n=7) had never learned something helpful about STI testing from anybody.

Of those participants who learned something helpful about STI testing from these sources, 84.3% (n=43) participants who learned something from their parents or another trusted adult received this education before the first time they had sex (See Table 5). Likewise, 66.7% (n=76) of those who learned from their friends, 53.5% (n=83) of those who learned from their doctor or other healthcare provider, 95.5% (n=127) of those who learned from a class or program in middle or high school, 69.3% (n=70) of those who learned from a class or program in college, 100% (n=3) of those who learned from a religious class or program, and 75.9% (n=104) of those who learned form the media (e.g., Internet, TV, radio) also received this education before their first sexual encounter (Table 6).

Table 6. STI Testing Education Source and Temporality

Source	Received n (%)	Not Received n (%)
Parents or another trusted adult	52 (19.1%)	220 (80.9%)
Before first sexual encounter	43 (84.3%)	
After first sexual encounter	8 (15.7%)	
Friends	121 (44.5%)	151 (55.5%)
Before first sexual encounter	76 (66.7%)	
After first sexual encounter	38 (33.3%)	
Doctor or other healthcare provider	162 (59.6%)	110 (40.4%)
Before first sexual encounter	83 (53.5%)	
After first sexual encounter	72 (46.5%)	
A class or program in middle or high school	137 (50.4%)	135 (49.6%)
Before first sexual encounter	127 (95.5%)	
After first sexual encounter	6 (4.5%)	
A class or program in college	108 (39.7%)	164 (60.3%)
Before first sexual encounter	70 (69.3%)	
After first sexual encounter	31 (30.7%)	
A religious class or program	4 (1.5%)	268 (98.5%)

Before first sexual encounter	3 (100.0%)	
After first sexual encounter	0 (0.0%)	
Media (e.g., Internet, TV, radio)	146 (53.7%)	
Before first sexual encounter	104 (75.9%)	126 (46.3%)
After first sexual encounter	33 (24.1%)	

Partner Communication Education

When indicating sources from whom they learned something helpful about talking to their sexual partner(s) about sexual health (condoms or STI testing), 17.6% (n=48) selected their parents or another trusted adult, 43.4% (n=118) selected their friends, 27.9% (n=76) selected their doctor or other healthcare provider, 31.6% (n=86) selected a class or program in middle or high school, 32.7% (n=89) selected a class or program in college, 0.7% (n=2) selected a religious class or program, and 38.2% (n=104) selected the media (e.g., Internet, TV, radio) (Table 7). 10.3% (n=28) had never learned something helpful about talking to their sexual partner(s) about sexual health from anybody.

Of those participants who learned something helpful about partner communication from these sources, 87% (n=40) participants who learned something from their parents or another trusted adult received this education before their first sexual encounter (Table 7). Likewise, 74.1% (n=80) of those who learned from their friends, 64.3% (n=45) of those who learned from their doctor or other healthcare provider, 92.9% (n=78) of those who learned from a class or program in middle or high school, 63.1% (n=53) of those who learned from a class or program in college, 50% (n=1) of those who learned from a religious class or program, and 73.7% (n=70) of those who learned form the media (e.g., Internet, TV, radio) also received this education before their first sexual encounter (Table 7).

Additionally, of participants who learned something helpful about partner communication from their parents or another trusted adult, 64.6% (n=31) felt more comfortable talking to their sexual partner(s) about sexual health after receiving this education (Table 8). Increased comfort was also reported for 87.2% (n=102) of those who learned from their friends, 75.7% (n=56) of those who learned from their doctor or other healthcare provider, 63.1% (n=53) of those who learned from a class or program in middle or high school, 80.9% (n=72) of those who learned from a class or program in college, 50% (n=1) of those who learned from a religious class or program, and 80.8% (n=84) of those who learned from the media (e.g., Internet, TV, radio) (Table 8).

Table 7. Partner Communication Education Source and Temporality

Source	Received n (%)	Not Received n (%)
Parents or another trusted adult	48 (17.6%)	224 (82.4%)
Before first sexual encounter	31 (64.6%)	
After first sexual encounter	14 (29.2%)	
Friends	118 (43.4%)	
Before first sexual encounter	80 (74.1%)	154 (56.6%)
After first sexual encounter	28 (25.9%)	
Doctor or other healthcare provider	76 (27.9%)	
Before first sexual encounter	45 (64.3%)	196 (72.1%)
After first sexual encounter	25 (35.7%)	
A class or program in middle or high school	86 (31.6%)	
Before first sexual encounter	78 (92.9%)	186 (68.4%)
After first sexual encounter	6 (7.1%)	
A class or program in college	89 (32.7%)	
Before first sexual encounter	53 (63.1%)	183 (67.3%)
After first sexual encounter	31 (36.9%)	
A religious class or program	2 (0.7%)	
Before first sexual encounter	1 (50.0%)	270 (99.3%)
After first sexual encounter	1 (50.0%)	
Media (e.g., Internet, TV, radio)	104 (38.2%)	
Before first sexual encounter	70 (73.7%)	168 (61.8%)
After first sexual encounter	25 (26.3%)	

Table 8. Partner Communication Education Effectiveness	
Source	**Received n (%)**
Parents or another trusted adult	48 (17.6%)
Increased Comfort	31 (64.6%)
Did not Increase Comfort	14 (29.2%)
Friends	118 (43.4%)
Increased Comfort	102 (87.2%)
Did not Increase Comfort	9 (7.7%)
Doctor or other healthcare provider	76 (27.9%)
Increased Comfort	56 (75.7%)
Did not Increase Comfort	11 (14.9%)
A class or program in middle or high school	86 (31.6%)
Increased Comfort	53 (63.1%)
Did not Increase Comfort	19 (22.6%)
A class or program in college	89 (32.7%)
Increased Comfort	72 (80.9%)
Did not Increase Comfort	12 (13.5%)
A religious class or program	2 (0.7%)
Increased Comfort	1 (50.0%)
Did not Increase Comfort	1 (50.0%)
Media (e.g., Internet, TV, radio)	104 (38.2%)
Increased Comfort	84 (80.8%)
Did not Increase Comfort	12 (11.5%)

Because so few participants indicated receiving any type of sexual health education from a religious class or program, this education source was not included in subsequent bivariate or multivariate analyses.

Research Question 1: To what extent are sexual health education source and number of sexual health education sources associated with sexual health knowledge and self-efficacy? Additionally, to what extent is the number of sexual health education sources associated with sexual health behavior?

Education Source and Condom Use Knowledge

There were no significant associations between education source and condom use knowledge; therefore these results are not included in Table 9.

Education Source and Condom Use Self-Efficacy

Independent samples t-testing between condom use education sources and condom use self-efficacy demonstrated significant associations between condom use self-efficacy and condom use education from parents or another trusted adult, friends, and a doctor or other healthcare provider (Table 9). Specifically, those who learned about condom use from their parents or another trusted adult had significantly higher condom use self-efficacy (mean=13.59, sd=1.48) than those who did not learn about condom use from their parent or another trusted adult (mean=12.77, sd=1.95) (t=-2.69, df=258, p=.008). Those who learned about condom use from their friends had significantly higher condom use self-efficacy (mean=13.34, sd=1.61) than those who did not learn about condom use from their friends (mean=12.46, sd=2.08) (t=-3.78, df=237.38, p<.001). Finally, those who learned about condom use from their doctor or other healthcare provider had significantly higher condom use self-efficacy (mean=13.34, sd=1.66) than those who did not learn about condom use from their doctor or other healthcare provider (mean=12.66, sd=1.99) (t=-2.85, df=258, p=.005).

Education Source and STI Testing Knowledge

Independent samples t-testing between STI testing education sources and STI testing knowledge demonstrated significant associations between STI testing knowledge and STI testing education from parents or another trusted adult, friends, a doctor or other healthcare provider, a class or program in college, and the media (Table 9). Specifically, those who learned about STI testing from their parents or another trusted adult had significantly higher STI transmission knowledge (mean=5.52, sd=1.16) than those who did not learn about STI testing from their parents or another trusted adult (mean=5.02,

sd=1.85) (t=-2.43, df=120.36, p=.016). Those who learned about STI testing from their friends had significantly higher STI transmission knowledge (mean=5.43, sd=1.25) than those who did not learn about STI testing from their friends (mean=4.87, sd=2.04) (t=-2.80, df=254.12, p=.006). Those who learned about STI testing from their doctor or other healthcare provider had significantly higher STI transmission knowledge (mean=5.52, sd=1.15) than those who did not learn about STI testing from their doctor or other healthcare provider (mean=4.52, sd=2.25) (t=-4.33, df=148.38, p<.001). Those who learned about STI testing from a class or program in college had significantly higher STI transmission knowledge (mean=5.56, sd=1.12) than those who did not learn about STI testing from a class or program in college (mean=4.82, sd=2.01) (t=-3.89, df=263.67, p<.001). Lastly, those who learned about STI testing from the media had significantly higher STI testing knowledge (mean=5.38, sd=1.34) than those who did not learn about STI testing from the media (mean=4.82, sd=2.09) (t=-2.58, df=207.37, p=.011).

Education Source and STI Testing Self-Efficacy

Independent samples t-testing between STI testing education sources and STI testing self-efficacy demonstrated significant associations between STI testing self-efficacy and STI testing education from parents or another trusted adult and a doctor or other healthcare provider (Table 9). Specifically, Those who learned about STI testing from their parents or another trusted adult had significantly higher STI testing self-efficacy scores (mean=4.69, sd=.58) than those who did not learn about STI testing from their parents or another trusted adult (mean=4.30, sd=.85) (t=-3.91, df=112.93, p<.001). Those who learned about STI testing from their doctor or other healthcare provider had significantly higher STI testing self-efficacy scores (mean=4.57, sd=.64) than those who did not learn

about STI testing from their doctor or other healthcare provider (mean=4.07, sd=.98) (t=-4.49, df=147.80, p<.001).

Education Source and Self-efficacy of Partner Communication about Condom Use

There were no significant associations between education source and self-efficacy of partner communication about condom use; therefore, these results were not included in Table 9.

Education Source and Self-Efficacy of Partner Communication about STI Testing

There were no significant associations between education source and self-efficacy of partner communication about STI testing; therefore, these results were not included in Table 9.

Table 9. Bivariate Associations between Condom Use Education Source & Personal Determinants of Sexual Health

	Personal Determinants					
Education Source	**Condom Use Self-Efficacy[a]**		**STI Testing Knowledge[b]**		**STI Testing Self-Efficacy[b]**	
	Mean (sd)	**p-value**	**Mean (sd)**	**p-value**	**Mean (sd)**	**p-value**
Parents or another trusted adult						
Not received	12.77 (1.95)	.008*	5.02 (1.85)	.016*	4.30 (0.85)	<.001**
Received	13.59 (1.48)		5.52 (1.16)		4.69 (0.58)	
Friends						
Not received	12.46 (2.08)	<.001**	4.87 (2.04)	.006*	4.31 (0.85)	.132
Received	13.34 (1.61)		5.43 (1.25)		4.46 (0.78)	
Doctor or other healthcare provider						
Not received	12.66 (1.99)	.005*	4.52 (2.25)	<.001**	4.07 (0.98)	<.001**
Received	13.34 (1.66)		5.52 (1.15)		4.57 (0.64)	
Class or program in middle or high school						
Not received	13.01 (1.76)	.131	4.93 (2.03)	.086	4.33 (0.81)	.377
Received	12.74 (2.01)		5.30 (1.40)		4.42 (0.83)	
Class or program in college						
Not received	12.94 (1.88)	.767	4.82 (2.01)	<.001**	4.34 (0.87)	.367
Received	12.86 (1.95)		5.56 (1.12)		4.44 (0.74)	

Media (e.g., Internet, TV, radio)						
Not received	13.04 (1.73)	.385	4.82 (2.09)	.011*	4.47 (0.65)	.092
Received	12.83 (2.00)		5.38 (1.34)		4.31 (0.92)	

[a]Tested for associations with education sources regarding condom use education
[b]Tested for associations with education sources regarding STI testing education
(*) p-value<.05, (**) p-value <.001

Number of Condom Use Education Sources

Pearson's R correlational analyses found significant associations between number of condom use education sources and STI testing knowledge (r=.327, p<.001), condom use self-efficacy (r=.123, p=.048), and STI testing self-efficacy (r=.171, p=.006) (Table 10). As the number of condom use education sources increases, participants' knowledge about STI testing, condom use self-efficacy, and STI testing self-efficacy each increase. An independent samples t-test demonstrated a significant association between number of condom use education sources and partner communication about STI testing behavior (t=-2.38, df=238, p=.018) (Table 10). Those who had ever asked partner(s) about STI testing (mean=2.77, sd=1.51) had significantly more sources of condom use education than those who had never asked partner(s) about STI testing (mean=2.31, sd=1.29).

Table 10. Bivariate Associations between Number of Condom Use Education Sources and Personal & Behavioral Determinants

Personal & Behavioral Determinants	r or Mean (sd)	p-value
Personal Determinants		
Condom Use Knowledge		
Knew latex condoms offer best protection against STIs	2.55 (1.49)	.866
Did not know latex condoms offer best protection against STIs	2.50 (1.39)	
STI Testing Knowledge	.327	<.001[a]**
Condom Use Self-Efficacy	.123	.048*
STI Testing Self-Efficacy	.171	.006[a]*
Self-Efficacy of Partner Communication about Condom Use	.031	.620
Self-Efficacy of Partner Communication about STI Testing	.071	.256
Behavioral Determinants		
Condom Use During Oral Sex	.005	.943
Condom Use During Vaginal Sex	.103	.130

Condom Use During Anal Sex	-.053	.685
STI Testing		
Ever been STI tested	2.75 (1.50)	.092
Never been STI tested	2.43 (1.34)	
Partner Communication about Condom Use	.043	.503
Partner Communication about STI Testing		
Ever asked partner(s) about STI testing	2.77 (1.51)	.018*
Never asked partner(s) about STI testing	2.31 (1.29)	
[a]significant within a 99% confidence interval (*) p-value<.05, (**) p-value <.001		

Number of STI Testing Education Sources

Pearson's R correlational analyses found significant associations between number of STI testing education sources and STI testing knowledge (r=.305, p<.001), condom use self-efficacy (r=.135, p=.029), and STI testing self-efficacy (r=.173, p=.005), and self-efficacy of partner communication about STI testing (r=.124, p=.047) (Table 11). As the number of STI testing education sources increases, participants' knowledge about STI testing, condom use self-efficacy, STI testing self-efficacy, and self-efficacy of partner communication about STI testing each increase. Independent samples t-tests demonstrated significant associations between number of STI testing education sources and STI testing behavior (t=-2.73, df=247, p=.007) as well as partner communication about STI testing (t=-2.85, df=238, p=.005) (Table 11). Those who had ever been STI tested (mean=3.11, sd=1.40) had significantly more STI testing education sources than those who had never been STI tested (mean=2.60, sd=1.50). Those who had ever asked partner(s) about STI testing (mean=3.07, sd=1.47) had significantly more sources of STI testing education than those who had never asked partner(s) about STI testing (mean=2.52, sd=1.34).

Table 11. Bivariate Associations between Number of STI Testing Education Sources and Personal & Behavioral Determinants		
Personal & Behavioral Determinants	**r or Mean (sd)**	**p-value**
Personal Determinants		
Condom Use Knowledge		
Knew latex condoms offer best protection against STIs	2.80 (1.50)	.379
Did not know latex condoms offer best protection against STIs	3.08 (1.60)	
STI Testing Knowledge	.305	<.001[a]**
Condom Use Self-Efficacy	.135	.029*
STI Testing Self-Efficacy	.173	.005[a]*
Self-Efficacy of Partner Communication about Condom Use	-.012	.853
Self-Efficacy of Partner Communication about STI Testing	.124	.047*
Behavioral Determinants		
Condom Use During Oral Sex	-.032	.622
Condom Use During Vaginal Sex	-.020	.773
Condom Use During Anal Sex	-.062	.640
STI Testing		
Ever been STI tested	3.11 (1.40)	.007*
Never been STI tested	2.60 (1.50)	
Partner Communication about Condom Use	-.046	.475
Partner Communication about STI Testing		
Ever asked partner(s) about STI testing	3.07 (1.47)	.005*
Never asked partner(s) about STI testing	2.52 (1.34)	
[a]significant within a 99% confidence interval (*) p-value<.05, (**) p-value <.001		

Number of Partner Communication Education Sources

Pearson's R correlational analyses found significant associations between number of partner communication education sources and STI testing knowledge (r=.231, p<.001), condom use self-efficacy (r=.142, p=.022), and STI testing self-efficacy (r=.152, p=.014) (Table 12). As the number of partner communication education sources increases, participants' knowledge about STI testing, condom use self-efficacy, and STI testing self-efficacy each increase. An independent samples t-test demonstrated a significant association between number of partner communication education sources and partner communication about STI testing behavior (t=-2.31, df=238, p=.022) (Table 12). Those who

had ever asked partner(s) about STI testing (mean=2.22, sd=1.38) had significantly more sources of condom use education than those who had never asked partner(s) about STI testing (mean=1.78, sd=1.48).

Table 12. Bivariate Associations between Number of Partner Communication Education Sources and Personal & Behavioral Determinants

Personal & Behavioral Determinants	r or Mean (sd)	p-value
Personal Determinants		
Condom Use Knowledge		
Knew latex condoms offer best protection against STIs	2.02 (1.46)	.857
Did not know latex condoms offer best protection against STIs	2.08 (1.65)	
STI Testing Knowledge	.231	<.001[a]**
Condom Use Self-Efficacy	.142	.022*
STI Testing Self-Efficacy	.152	.014*
Self-Efficacy of Partner Communication about Condom Use	.064	.302
Self-Efficacy of Partner Communication about STI Testing	.096	.123
Behavioral Determinants		
Condom Use During Oral Sex	-.045	.486
Condom Use During Vaginal Sex	.075	.271
Condom Use During Anal Sex	-.022	.868
STI Testing		
Ever been STI tested	2.08 (1.38)	.956
Never been STI tested	2.07 (1.57)	
Partner Communication about Condom Use	.064	.315
Partner Communication about STI Testing		
Ever asked partner(s) about STI testing	2.22 (1.38)	.022*
Never asked partner(s) about STI testing	1.78 (1.48)	

[a]significant within a 99% confidence interval
(*) p-value<.05, (**) p-value <.001

Research Question 2: To what extent are sexual health knowledge, self-efficacy, education source, and education temporality associated with young adults' sexual health behavior?

Bivariate Analysis

Condom Use Behavior. The results of an independent samples t-test found a significant association between condom use behavior during oral sex and receiving condom use education from a parent or another trusted adult (Table 13). Those who learned about condom use from a parent or other trusted adult (mean=1.02, sd=0.15) were

significantly less likely to use a condom during oral sex than those who did not learn about condom use from a parent or other trusted adult (mean=1.10, sd=0.37) (t=2.41, df=172.76, p=.017).

The results of independent samples t-testing found significant associations between condom use behavior during vaginal sex and receiving condom use education from a doctor or other healthcare provider before the first time having sex and condom use behavior during vaginal sex and receiving condom use education from a class or program in college (Table 13). Those who learned about condom use from a doctor or other healthcare provider before the first time having sex (mean=3.14, sd=1.11) were significantly more likely to use a condom during vaginal sex than those who learned about condom use from a doctor or other healthcare provider after the first time having sex (mean=2.42, sd=1.12) (t=2.68, df=74, p=.009). Those who learned about condom use from a class or program in college (mean=3.04, sd=1.03) were significantly more likely to use a condom during vaginal sex than those who did not learn about condom use from a class or program in college (mean=2.63, sd=1.19) (t=-2.61, df=157.10, p=.01). Additionally, a Pearson's R correlation found a significant positive association between condom use behavior during vaginal sex and self-efficacy of partner communication about condom use within a 99% confidence interval (r=.297, p<.001) (Table 13).

The results of an independent samples t-test found a significant association between condom use behavior during anal sex and receiving condom use education from a class or program in middle or high school before the first time having sex (Table 13). Those who learned about condom use from a class or program in middle or high school before the first time they had sex (mean=2.03, sd=1.30) were significantly more likely to use a condom

during anal sex than those who learned about condom use from a class or program in middle or high school after the first time they had sex (mean=1.00, sd=0) (t=4.581, df=25, p<.001). Additionally, a Pearson's R correlation found a significant positive association between condom use behavior during anal sex and self-efficacy of partner communication about condom use (r=.372, p=.003) (Table 13).

Table 13. Bivariate Associations between Personal & Environmental Determinants and Condom Use Behavior

Personal & Environmental Determinants	Condom Use					
	Oral Sex		Vaginal Sex		Anal Sex	
	Mean (sd)	p-value	Mean (sd)	p-value	Mean (sd)	p-value
Personal Determinants						
Condom Use Knowledge						
Knew latex condoms best protect against STIs	1.09 (0.34)	.930	2.78 (1.16)	.618	2.42 (1.36)	.643
Did not know latex condoms best protect against STIs	1.08 (0.28)		2.65 (1.11)		2.20 (1.40)	
Condom Use Self-Efficacy	--	.418	--	.239	--	.231
STI Testing Knowledge	--	.472	--	.284	--	.064
STI Testing Self-Efficacy	--	.915	--	.851	--	.782
Partner Communication Self-Efficacy (Condom Use)	--	.237	--	<.001[a]**	--	.003[a]*
Partner Communication Self-Efficacy (STI Testing)	--	.458	--	.311	--	.989
Environmental Determinants—Condom Use Education						
Parents or another trusted adult						
Not received	1.10 (0.37)	.017*	2.72 (1.15)	.266	2.29 (1.35)	.242
Received	1.02 (0.15)		2.95 (1.18)		2.82 (1.33)	
Before first sex	1.03 (0.16)	.826	3.00 (1.22)	.572	2.75 (1.28)	.388
After first sex	1.00 (0.00)		2.50 (0.71)		4.00 (--)	
Friends						
Not received	1.10 (0.41)	.508	2.82 (1.14)	.532	2.43 (1.36)	.778
Received	1.08 (0.27)		2.72 (1.17)		2.33 (1.37)	
Before first sex	1.09 (0.28)	.858	2.78 (1.18)	.358	2.39 (1.37)	.076
After first sex	1.07 (0.27)		2.46 (0.97)		1.40 (0.89)	

Doctor or other healthcare provider						
Not received	1.09 (0.36)	.808	2.72 (1.17)	.464	2.33 (1.37)	.729
Received	1.10 (0.30)		2.84 (1.14)		2.46 (1.35)	
Before first sex	1.08 (0.27)	.335	3.11 (1.11)	.009*	2.73 (1.42)	.127
After first sex	1.15 (0.36)		2.42 (1.12)		1.82 (1.25)	
Class or program in middle or high school						
Not received	1.08 (0.35)	.616	2.75 (1.18)	.894	2.68 (1.35)	.082
Received	1.10 (0.32)		2.78 (1.14)		2.07 (1.31)	
Before first sex	1.11 (0.33)	.482	2.81 (1.13)	.334	2.03 (1.30)	<.001**
After first sex	1.00 (0.00)		2.25 (1.26)		1.00 (0.00)	
Class or program in college						
Not received	1.07	.252	2.63 (1.19)	.010*	2.26 (1.40)	.293
Received	1.13 (0.46)		3.04 (1.03)		2.67 (1.24)	
Before first sex	1.14 (0.52)	.805	3.07 (1.05)	.923	2.43 (1.34)	.466
After first sex	1.12 (0.33)		3.04 (0.95)		2.83 (0.98)	
Media (e.g., Internet, TV, radio)						
Not received	1.09 (0.41)	.967	2.69 (1.15)	.445	2.68 (1.41)	.153
Received	1.09 (0.29)		2.81 (1.16)		2.17 (1.30)	
Before first sex	1.09 (0.29)	.763	2.86 (1.19)	.345	2.10 (1.29)	.380
After first sex	1.11 (0.31)		2.62 (1.06)		1.70 (1.06)	

[a]significant within a 99% confidence interval
(*) p-value <.05, (**) p-value <.001, (--) value unavailable

STI Testing Behavior. The results of independent samples t-testing found that STI testing behavior is significantly associated with condom use self-efficacy, STI testing knowledge, and STI testing self-efficacy (Table 14). Those who had ever been STI tested (mean=13.19, sd=1.73) had significantly higher condom use self-efficacy than those who had not been STI tested (mean=12.52, sd=2.11) (t=-2.76, df=247, p=.006). Those who had ever been STI tested (mean=5.68, sd=0.97) knew significantly higher STI testing knowledge than those who had not been STI tested (mean=5.01, sd=1.57) (t=-3.80, df=150.31, p<.001). Those who had ever been STI tested (mean=4.64, sd=0.55) had significantly higher STI

testing self-efficacy than those who had never been STI tested (mean=4.03, sd=1.0) (t=-5.55, df=139.17, p<.001).

The results of chi-square analyses found that STI testing behavior is significantly associated with receiving STI testing education from friends before the first time having sex, a doctor or other healthcare provider, and a doctor or other healthcare provider before the first time having sex (Table 14). Those who learned about STI testing from their friends before the first time having sex were significantly more likely to have gotten STI tested than those who learned about STI testing from their friends after the first time having sex (X^2=5.15, df=1, p=.023). 58.9% (N=43) of those who received STI testing education from friends before the first time having sex got STI tested, as opposed to only 41.1% (n=30) of those who received STI testing education from friends after the first time having sex. Those who learned about STI testing from their doctor or other healthcare provider were significantly more likely to have gotten tested for STIs than those who had not learned about STI testing from their doctor or other healthcare provider (X^2=42.56, df=1, p<.001). Of those who had learned about STI testing from a provider, 81.2% (n=121) had been STI tested, as opposed to only 18.8% (n=28) of those who had not learned about STI testing from a provider. Those who learned about STI testing from their doctor or other healthcare provider after the first time they had sex were significantly more likely to have gotten tested for STIs than those who learned about STI testing form their doctor or other healthcare provider before the first time they had sex (X^2=9.97, df=1, p=.002). 53.9% (n=62) of those who received STI testing education from a doctor or other healthcare provider after the first time having sex got STI tested, as opposed to only 46.1% (n=53) of those who received STI testing education from a doctor or other healthcare provider before

the first time having sex. Additionally, chi-square analysis found a significant association, between STI testing behavior and receiving STI testing education from a class or program in college before the first time having sex (X^2=9.64, df=1, p=.002) (Table 14). 58.5% (n=38) of those who received STI testing education from a class or program in college before the first time having sex got STI tested, as opposed to only 41.5% (n=27) of those who received STI testing education from a class or program in college after the first time having sex. However, these chi-square results included a cell with a cell count less than 5; therefore, this variable was excluded from subsequent multivariate analyses.

Table 11. Bivariate Associations between Personal & Environmental Determinants and STI Testing Behavior

Personal/ Environmental Determinants	STI Testing	
	Mean (sd) or Ever STI tested n (%)	p-value
Personal Determinants		
Condom Use Knowledge		
Knew latex condoms best protect against STIs	134 (59.8%)	.986
Did not know latex condoms best protect against STIs	15 (60.0%)	
Condom Use Self-Efficacy		
STI tested	13.19 (1.73)	.006*
Not STI tested	12.52 (2.11)	
STI Testing Knowledge		
STI tested	5.68 (0.97)	<.001**
Not STI tested	5.01 (1.57)	
STI Testing Self-Efficacy		
STI tested	4.64 (0.55)	<.001**
Not STI tested	4.03 (1.00)	
Partner Communication Self-Efficacy (Condom Use)		
STI tested	4.51 (0.79)	.836
Not STI tested	4.53 (0.67)	
Partner Communication Self-Efficacy (STI Testing)		
STI tested	4.05 (0.96)	.508

Not STI tested	3.96 (1.09)	
Environmental Determinants—STI Testing Education		
Parents or another trusted adult		
Not received	114 (57.9%)	.217
Received	35 (67.3%)	
Before first sex	26 (76.5%)	.029[a]*
After first sex	8 (23.5%)	
Friends		
Not received	73 (56.2%)	.215
Received	76 (63.9%)	
Before first sex	43 (58.9%)	.023*
After first sex	30 (41.1%)	
Doctor or other healthcare provider		
Not received	28 (32.2%)	<.001**
Received	121 (74.7%)	
Before first sex	53 (46.1%)	.002*
After first sex	62 (53.9%)	
Class or program in middle or high school		
Not received	71 (62.8%)	.380
Received	78 (57.4%)	
Before first sex	70 (93.3%)	.180
After first sex	5 (6.7%)	
Class or program in college		
Not received	81 (56.6%)	.232
Received	68 (64.2%)	
Before first sex	38 (58.5%)	.002[a]*
After first sex	27 (41.5%)	
Media (e.g., Internet, TV, radio)		
Not received	65 (61.9%)	.570
Received	84 (58.3%)	
Before first sex	56 (70.0%)	.062
After first sex	24 (30.0%)	
[a]Cell in chi-square analysis has cell count <5 (*) p-value <.05, (**) p-value <.001		

Partner Communication Behavior. The results of a Pearson's R correlation indicated that self-efficacy of partner communication about condom use is significantly

associated with partner communication about condom use behavior (r=0.346, p<.001) (Table 15). The results of an independent samples t-test found a significant association between receiving partner communication education from a doctor or other healthcare provider before the first time having sex and partner communication about condom use behavior (Table 15). Those who received partner communication education from a doctor or other healthcare provider before the first time having sex (mean=3.02, sd=0.89) were significantly more likely to talk to their partner(s) about condom use than those who received partner communication education from a doctor or other healthcare provider after the first time having sex (mean=2.16, sd=1.31) (t=2.92, df=36.92, p=.006). Additionally, the results of Pearson's R correlational analyses indicated that within a 99% confidence interval, condom use self-efficacy (r=.202, p=.001) and self-efficacy of partner communication about condom use (r=.346, p<.001) are significantly associated with partner communication about condom use behavior (Table 15).

The results of independent samples t-testing found significant associations between partner communication about STI testing behavior and condom use self-efficacy, STI testing knowledge, STI testing self-efficacy, and self-efficacy of partner communication about STI testing (Table 15). Those who had ever asked their partner(s) about STI testing (mean=13.25, sd=1.85) had significantly higher condom use self-efficacy than those who had never asked their partner(s) about STI testing (mean=12.27, sd=1.94) (t=-3.89, df=238, p<.001). Those who had ever asked their partner(s) about STI testing (mean=5.60, sd=1.11) had significantly higher STI testing knowledge than those who had never asked their partner(s) about STI testing (mean=4.95, sd=1.59) (t=-3.34, df=132.49, p=.001). Those who had ever asked their partner(s) about STI testing (mean=4.47, sd=0.77) had

significantly higher STI testing self-efficacy than those who had never asked their partner(s) about STI testing (mean=4.19, sd=0.9) (t=-2.61, df=238, p=.01). Those who had ever asked their partner(s) about STI testing (mean=4.25, sd=0.87) had significantly higher self-efficacy of partner communication about STI testing than those who had never asked their partner(s) about STI testing (mean=3.59, sd=1.14) (t=-4.65, df=141.46, p<.001).

The results of chi-square analysis found a significant association between learning about partner communication from a parent or another trusted adult and partner communication about STI testing behavior (Table 15). Those who received partner communication education from a parent or trusted adult were significantly more likely to have asked their partner(s) about STI testing than those who did not receive partner communication education from a parent or trusted adult (X^2=4.03, df=1, p=.045). Of those who learned about partner communication from a parent or another trusted adult, 77.3% (n=34) had ever asked their partner(s) about STI testing, as opposed to only 61.2% (n=12) of those who did not learn about partner communication from their parents or another trusted adult.

Table 15. Bivariate Associations between Personal & Environmental Determinants and Partner Communication Behavior

Personal/ Environmental Determinants	Partner Communication			
	Condom Use		STI Testing	
	Mean (sd)	p-value	Mean (sd) or n (%) Ever talked to partner(s) about STI testing	p-value
Personal Determinants				
Condom Use Knowledge				
Knew latex condoms best protect against STIs	2.65 (1.09)	.919	138 (62.2%)	.985
Did not know latex condoms best protect against	2.63 (1.01)		16 (64.0%)	

Condom Use Self-Efficacy		--	.001[a]*	
Ever asked partner(s) about STI testing			13.25 (1.85)	<.001**
Never asked partner(s) about STI testing			12.27 (1.94)	
STI Testing Knowledge		--	.121	
Ever asked partner(s) about STI testing			5.60 (1.11)	.001*
Never asked partner(s) about STI testing			4.95 (1.59)	
STI Testing Self-Efficacy		--	.263	
Ever asked partner(s) about STI testing			4.47 (0.77)	.010*
Never asked partner(s) about STI testing			4.19 (0.90)	
Partner Communication Self-Efficacy (Condom Use)		--	<.001**	
Ever asked partner(s) about STI testing			4.53 (0.77)	.708
Never asked partner(s) about STI testing			4.49 (0.70)	
Partner Communication Self-Efficacy (STI Testing)		--	.267	
Ever asked partner(s) about STI testing			4.25 (0.87)	<.001**
Never asked partner(s) about STI testing			3.59 (1.14)	
Environmental Determinants—Partner Communication Education				
Parents or another trusted adult				
Not received	2.62 (1.06)	.488	120 (61.2%)	.045*
Received	2.74 (1.15)		34 (77.3%)	
Before first sex	2.79 (1.15)	.805	26 (72.2%)	.139
After first sex	2.67 (1.37)		6 (100%)	
Friends				
Not received	2.66 (1.09)	.875	78 (59.5%)	.101
Received	2.63 (1.06)		76 (69.7%)	
Before first sex	2.71 (1.07)	.294	52 (71.2%)	.658
After first sex	2.46 (1.07)		18 (66.7%)	
Doctor or other healthcare provider				
Not received	2.66 (1.05)	.814	103 (61.3%)	.159
Received	2.62 (1.14)		51 (70.8%)	
Before first sex	3.02 (0.89)	.006*	28 (66.7%)	.479
After first sex	2.16 (1.31)		18 (75.0%)	
Class or program in middle or high school				
Not received	2.62 (1.07)	.531	103 (65.6%)	.523
Received	2.71 (1.09)		51 (61.4%)	
Before first sex	2.78 (1.09)	.183	45 (59.2%)	.069
After first sex	2.17 (0.98)		5 (100%)	
Class or program in college				
Not received	2.58 (1.12)	.211	94 (60.6%)	.124
Received	2.76 (0.99)		60 (70.6%)	

Before first sex	2.86 (1.00)	.409	34 (66.7%)	.121
After first sex	2.68 (0.94)		24 (82.8%)	
Media (e.g., Internet, TV, radio)				
Not received	2.60 (1.07)	.376	86 (61.4%)	.295
Received	2.72 (1.09)		68 (68.0%)	
Before first sex	2.79 (1.18)	.258	49 (73.1%)	.547
After first sex	2.52 (0.92)		16 (66.7%)	
[a]significant within a 99% confidence interval (**) p-value <.05, (**) p-value<.001, (--) value unavailable				

Multivariate Analysis

Due to the absence of transgender participants (Table 1), only male and female participants were considered for bivariate and subsequent multivariate analyses involving gender. Additionally, due to the low percentage of Native Hawaiian or Pacific Islander participants and the absence of American Indian or Alaska Native participants, only White, Black/African-American, and Asian participants were considered for bivariate and subsequent multivariate analyses involving race.

Condom Use Behavior During Oral Sex. Bivariate analyses revealed that receiving condom use education form a parent or another trusted adult (p=.017) (Table 13) and STI history (p<.001) are sufficiently independently associated with condom use behavior during oral sex at the p<.05 and p<.2 levels, as discussed in *Analysis*. Correlational analysis found no instances of colinearity; therefore, both variables were included in the subsequent linear regression model using the Enter method.

The results of the linear regression model indicated no significant associations between condom use behavior during oral sex and receiving condom use education from a parent or another trusted adult when controlling for STI history (p=.138) or between condom use behavior during oral sex and STI history when controlling for receiving

condom use education from a parent or another trusted adult (p=.217). The total regression model accounted for only 1.5% of the variance in condom use behavior during oral sex scores.

Condom Use Behavior During Vaginal Sex. Bivariate analyses revealed that temporality of receiving condom use education from a doctor or other healthcare provider (p=.009), receiving condom use education from a class or program in college (p=.01) (Table 13), gender (p=.148), birth control use (p=.002), and STI history (p=.02) (Appendix X) are sufficiently independently associated with condom use behavior during vaginal sex at the p<.05 and p<.2 levels as discussed in *Analysis*. Correlational analysis found no instances of colinearity; therefore, all indicated variables were included in the subsequent linear regression model using the Enter method.

The results of the linear regression model suggest that receiving condom use education from a class or program in college is significantly associated with condom use behavior during vaginal sex when adjusting for temporality of condom use education form a doctor or other healthcare provider, gender, birth control use, and STI history (B=.227, 95%CI=.020, 1.05, p=.042) (Table 16). Specifically, those who received condom use education from a class or program in college had a condom use during vaginal sex score 0.227 points higher than that of those who did not receive condom use education from a class or program in college. The total regression model accounted for 20.3% of the variance in condom use behavior during vaginal sex scores.

Table 16. Demographics and Personal & Environmental Determinants' Associations with Condom Use Behavior During Vaginal Sex: Multiple Linear Regression					
Variable	**R^2**	**Standardized β**	**95% CI**		**p-value**
	.203				
Participant Demographics					
Gender		.083	-.546	1.18	.468
Birth Control Use		-.221	-1.41	.001	.050
STI History		.008	-.853	.915	.944
Environmental Determinants					
Temporality of condom use education from doctor or other healthcare provider		-.203	-1.03	.070	.086
Condom use education from a class or program in college		.227	.020	1.05	.042*
(*) p<.05, (**) p<.001					

Condom Use Behavior During Anal Sex. Bivariate analyses revealed that temporality of condom use education from a class or program in middle or high school (p<.001) (Table 13), gender (p<.001), race (p=.079), sexual preference (p=.051), and birth control use (p=.007) are sufficiently independently associated with condom use behavior during anal sex at the p<.05 and p<.2 levels as discussed in *Analysis*. Correlational analysis found no instances of colinearity; therefore, all indicated variables were included in the subsequent linear regression model using the Enter method.

The results of the linear regression model indicated no significant associations between condom use behavior during anal sex and condom use education from a class or program in middle or high school (p=.490), gender (p=.372), race (Black/African-American) (p=.084), race (Asian) (p=.157), or birth control use (p=.119). The total regression model accounted for 28% of the variance in condom use behavior during anal sex scores.

STI Testing Behavior. Because STI testing is required to diagnose an STI, STI history was not included in the model for STI testing behavior. Bivariate analyses revealed

that condom use self-efficacy (p=.006), STI testing knowledge (p<.001), STI testing self-efficacy (<.001), temporality of STI testing education from friends (p=.023), STI testing education from a doctor or other healthcare provider (p<.001) (Table 14), gender (p=.005), race (p=.016), sexual preference (p<.001), and birth control use (p=.001) are independently associated with STI testing behavior at the p<.05 and p<.2 levels as discussed in *Analysis*. Correlational analysis found associations above the r<.5 level between condom use self-efficacy and STI testing self-efficacy (r=.690, p<.001) and between gender and sexual preference (r=.672, p<.001). Condom use self-efficacy and STI testing self-efficacy may be related due to the fact that confidence regarding one aspect of one's sexual health may likely extend to other aspects of sexual health as well. Because these two variables may be related, but measure distinctly different instances of self-efficacy, neither variable was excluded from the model. Similarly, gender and sexual preference measure distinct participant characteristics and were also included in the model. These variables in addition to those indicated above were all included in the subsequent logistic regression model.

The results of the logistic regression model (Table 17) suggest that for each unit increase in STI testing knowledge, participants are 4.44 times more likely to have ever been STI tested (AOR=4.44, 95%CI=1.30, 15.23, p=.018). For each unit increase in STI testing self-efficacy, participants are 10.20 times more likely of having ever been STI tested (AOR=10.20, 95%CI=1.62, 64.27, p=.013). Those who receive STI testing education from friends are 13.79 times more likely to be STI tested than those who do not receive STI testing education from friends (AOR=13.79, 95%CI=1.65, 115.56, p=.016). Those who received STI testing education from a doctor or other healthcare provider are 24.80 times

more likely to be STI tested than those who do not receive STI testing education from a doctor or other healthcare provider (AOR=24.80, 95%CI= 3.46, 177.84, p=.001). Those who are Asian are 0.027 times less likely to be STI tested than those who are White or Black/African-American (AOR=.027, 95%CI=.002, .308, p=.004). Those who generally have sex with both men and women are 20.55 times more likely to be STI tested than those who have sex with men or women exclusively (AOR=20.55, 95%CI= 1.02, 415.0, p=.049). Finally, those who use birth control are 11.12 times more likely to be STI tested than those who do not use birth control (AOR=11.12, 95%CI=1.83, 67.61, p=.009).

Table 17. Demographics and Personal & Environmental Determinants' Associations with STI Testing Behavior: Multiple Logistic Regression

Variable	AOR	95% CI		p-value
Demographics				
Gender	1.02	.017	62.47	.992
Race				
White (Reference)	--	--	--	--
Black/African-American	.134	.010	1.87	.135
Asian	.027	.002	.308	.004*
Sexual Preference				
Exclusively Men (Reference)	--	--	--	--
Both Men and Women	20.55	1.02	415.0	.049*
Exclusively Women	.351	.008	15.33	.587
Birth Control Use	11.12	1.83	67.61	.009*
Personal Determinants				
Condom Use Self-Efficacy	.768	.351	1.68	.510
STI Testing Knowledge	4.44	1.30	15.23	.018*
STI Testing Self-Efficacy	10.20	1.62	64.27	.013*
Environmental Determinants				
Temporality of STI testing education from friends	13.79	1.65	115.56	.016*
STI testing education from doctor or other healthcare provider	24.80	3.46	177.84	.001*
(*) p<.05, (**) p<.001, (--) value not available				

Partner Communication about Condom Use Behavior. Bivariate analyses revealed that self-efficacy of partner communication about condom use (p<.001),

temporality of partner communication education from a doctor or other healthcare provider (p=.006) (Table 15), and birth control use (p=.115) are sufficiently independently associated with partner communication about condom use behavior at the p<.05 and p<.2 levels as discussed in *Analysis*. Correlational analysis found no instances of colinearlity; therefore, all indicated variables were included in the subsequent linear regression model using the Enter method.

The results of the linear regression suggest that partner communication about condom use is significantly associated with self-efficacy of partner communication about condom use when adjusting for temporality of partner communication education from a doctor or other healthcare provider and birth control use (B=.263, 95%CI=.062, .808) (Table 18). For each unit increase in self-efficacy of partner communication about condom use, partner communication about condom use increased by 0.435. Temporality of partner communication education from a doctor or other healthcare provider was significantly associated with partner communication about condom use (B=-.339, 95%CI=-1.34, -.271) (Table 18). Those who received partner communication education from a doctor or other healthcare provider after the first time having sex had a partner communication about condom use score 0.339 points lower than those who received partner communication education from a doctor or other healthcare provider before the first time having sex. The total regression score accounted for 25.5% of the variance in partner communication about condom use behavior scores.

Table 18. Demographics and Personal & Environmental Determinants' Associations with Partner Communication about Condom Use Behavior: Multiple Linear Regression					
Variable	**R^2**	**Standardized β**	**95% CI**		**p-value**
	.243				
Demographics					
Birth Control Use		-.163	-1.12	.163	.141
Personal Determinants					
Self-Efficacy of Partner Communication about Condom Use		.279	.094	.833	.015*
Environmental Determinants					
Temporality of condom use education from doctor or other healthcare provider		-.307	-1.24	-.199	.007*
(*) p<.05, (**) p<.001, (--) value not available					

Partner Communication about STI Testing Behavior. Bivariate analyses revealed that condom use self-efficacy (p<.001), STI testing knowledge (p=.001), STI testing self-efficacy (p=.01), self-efficacy of partner communication about STI testing (p<.001), partner communication education from parents or another trusted adult (p=.045) (Table 15), gender (p=.097), sexual preference (p=.011), birth control use (p=.008), and STI history (p=.027) are sufficiently independently associated with partner communication about STI testing behavior at the p<.05 and p<.2 levels as discussed in *Analysis*. Correlational analysis found an association above the r<.5 level between condom use self-efficacy and self-efficacy of partner communication about STI testing (r=.833, p<.001). Because these two variables may be related, but measure distinctly different instances of self-efficacy, neither variable was excluded from the model. These variables in addition to those indicated above were all included in the subsequent logistic regression model.

The results of the logistic regression model indicate that for each unit increase in STI testing knowledge, the likelihood of talking to partner(s) about STI testing increased by 1.40 times (AOR=1.40, 95%CI=1.11, 1.75, p=.004). Those who use birth control were 2.33

times more likely to talk to partner(s) about STI testing than those who did not use birth control (AOR=2.33, 95%CI=1.17, 4.62, p=.016). Finally, for each unit increase in perceived self-efficacy of partner communication about STIs, the likelihood of talking to partner(s) about STI testing increased by 4.23 times (AOR=4.23, 95%CI=2.01, 8.87, p<.001) (Table 19).

Table 19. Demographics and Personal & Environmental Determinants' Associations with Partner Communication about STI Testing Behavior: Multiple Logistic Regression

Variable	AOR	95% CI		p-value
Demographics				
Gender	1.92	.460	8.03	.370
Sexual Preference				
Exclusively Men (Reference)	--	--	--	--
Both Men and Women	4.04	.928	17.61	.063
Exclusively Women	.328	.072	1.49	.148
Birth Control Use	2.33	1.17	4.62	.016*
STI History	5.44	.982	30.11	.053
Personal Determinants				
Condom Use Self-Efficacy	.612	.375	1.00	.050
STI Testing Knowledge	1.40	1.11	1.75	.004*
STI Testing Self-Efficacy	1.51	.763	2.97	.238
Self-Efficacy of Partner Communication about STI Testing	4.23	2.01	8.87	<.001**
Environmental Determinants				
Partner communication education from parents or another trusted adult	1.71	.722	4.07	.222
(*) p<.05, (**) p<.001, (--) value not available				

Exploratory Aim: Do differences in sexual health knowledge, self-efficacy, behavior, educational source, and/or education temporality exist between individuals from the Southern U.S. vs. other areas of the U.S.?

Geography and Participant Characteristics

Chi-square analysis found a significant association between geography and ever having had an STI (X^2=4.11, df=1, p=.043) (Table 17). 9.9% (n=16) of those from the Southern U.S. had ever had an STI, as compared to only 3.1% (n=3) of those not from the

Southern U.S. Notably, one of the cells in the chi-square analysis had a cell count less than 5 (Table 20).

Table 20. Bivariate Associations between Geography & Participant Characteristics		
Participant Characteristics	**Geography**	
	Mean (sd) or n (%)	**p-value**
Ever participated in oral sex		
From Southern U.S.	164 (97.6%)	.113
Not from Southern U.S.	104 (100%)	
Ever participated in vaginal sex		
From Southern U.S.	145 (86.3%)	.698
Not from Southern U.S.	88 (84.6%)	
Ever participated in anal sex		
From Southern U.S.	44 (26.2%)	.090
Not from Southern U.S.	18 (17.3%)	
Age when first had vaginal sex		
From Southern U.S.	18.60 (2.36)	.176
Not from Southern U.S.	18.18 (2.10)	
Have had more than one sexual partner in lifetime		
From Southern U.S.	113 (68.9%)	.351
Not from Southern U.S.	75 (74.3%)	
Have had more than one sexual partner in past 12 months		
From Southern U.S.	45 (27.4%)	.282
Not from Southern U.S.	34 (33.7%)	
Use of birth control other than condoms		
From Southern U.S.	107 (65.6%)	.612
Not from Southern U.S.	68 (68.7%)	
Ever had an STD		
From Southern U.S.	16 (9.9%)	.043[a]*
Not from Southern U.S.	3 (3.1%)	
[a]Cell in chi-square analysis has cell count <5 (*) p-value <.05, (**) p-value <.001		

Geography and Personal Determinants

There were no significant associations between geography and condom use knowledge, STI testing knowledge condom use self-efficacy, STI testing self-efficacy, self-efficacy of partner communication about condom use, or self-efficacy of partner communication about STI testing (Table 21).

Table 21. Bivariate Associations between Geography & Personal Determinants

Personal Determinants	Geography	
	Mean (sd) or n (%)	p-value
Condom Use Knowledge (Knew latex condoms best protect against STIs)		
From Southern U.S.	142 (88.8%)	.424
Not from Southern U.S.	90 (91.8%)	
STI Testing Knowledge		
From Southern U.S.	5.26 (1.62)	.097
Not from Southern U.S.	4.88 (1.92)	
Condom Use Self-Efficacy		
From Southern U.S.	12.99 (1.92)	.412
Not from Southern U.S.	12.79 (1.86)	
STI Testing Self-Efficacy		
From Southern U.S.	4.37 (0.84)	.839
Not from Southern U.S.	4.39 (0.78)	
Partner Communication Self-Efficacy (Condom Use)		
From Southern U.S.	4.52 (0.78)	.780
Not from Southern U.S.	4.49 (0.69)	
Partner Communication Self-Efficacy (STI Testing)		
From Southern U.S.	4.09 (0.99)	.130
Not from Southern U.S.	3.90 (1.02)	
(*) p-value <.05, (**) p-value <.001		

Geography and Behavioral Determinants

There were no significant associations between geography and condom use behavior during oral, vaginal, or anal sex, STI testing behavior, or partner communication about condom use or STI testing behavior (Table 22).

Table 22. Bivariate Associations between Geography & Behavioral Determinants

Behavioral Determinants	Geography	
	Mean (sd) or n (%)	p-value
Condom Use During Oral Sex		
From Southern U.S.	1.09 (0.37)	.932
Not from Southern U.S.	1.09 (0.29)	
Condom Use During Vaginal Sex		
From Southern U.S.	2.76 (1.18)	.897
Not from Southern U.S.	2.78 (1.13)	
Condon Use During Anal Sex		
From Southern U.S.	2.24 (1.34)	.760
Not from Southern U.S.	2.35 (1.39)	
STI Testing		
From Southern U.S.	92 (59.7%)	.968
Not from Southern U.S.	57 (60.0%)	
Partner Communication about Condom Use		
From Southern U.S.	2.67 (1.09)	.617
Not from Southern U.S.	2.60 (1.05)	
Partner Communication about STI Testing		
From Southern U.S.	95 (64.2%)	.993
Not from Southern U.S.	59 (64.1%)	

[a]Cell in chi-square analysis has cell count <5
(*) p-value <.05, (**) p-value <.001

Geography and Environmental Determinants

Chi-square analyses results indicated significant associations between being from the Southern U.S. and condom use, STI testing, and partner communication education from

friends and from a class or program in middle or high school (Table 23). There is a significant association between being from the Southern U.S. and receiving condom use education from friends before the first time having sex (X^2=4.78, df=1, p=.029). 94% (n=63) of those from the Southern U.S. who received condom use education from friends received this information before the first time having sex, as opposed to 81.1% (n=43) of those not from the Southern U.S. However, one of the cells in the chi-square analysis results had a cell count less than 5. There is also a significant association between being from the Southern U.S. and not receiving condom use education from a class or program in middle or high school (X^2=17.51, df=1, p<.001). 65.4% (n=68) of those not from the Southern U.S. received condom use education from a class or program in middle or high school, as compared to 39.3% (n=66) of those from the Southern U.S.

There is a significant association between being from the Southern U.S. and receiving STI testing education from friends before the first time having sex (X^2=4.63, df=1, p=.031). 74.6% (n=50) of those from the Southern U.S. who received STI testing education from friends received this information before the first time having sex, as opposed to only 55.3% (n=26) of those not from the Southern U.S. There is also a significant association between being from the Southern U.S. and not receiving STI testing education from a class or program in middle or high school (X^2=5.76, df=1, p=.016). 59.6% (n=62) of those not from the Southern U.S. received STI testing education from a class or program in middle or high school, as compared to 44.6% (n=75) of those from the Southern U.S.

There is a significant association between being from the Southern U.S. and not receiving partner communication education from friends (X^2=5.00, df=1, p=.025). 51.9% (n=54) of those not from the Southern U.S. received partner communication education

from friends, as opposed to only 38.1% (n=64) of those from the Southern U.S. There is also a significant association between being from the Southern U.S. and not receiving partner communication education from a class or program in middle or high school (X^2=21.10, df=1, p=.016). 48.1% (n=50) of those not from the Southern U.S. received partner communication education from a class or program in middle or high school, as compared to only 21.4% (n=36) of those from the Southern U.S.

Table 23. Bivariate Associations between Geography and Environmental Determinants

Education Source	Condom Use Education		STI Testing Education		Partner Communication Education	
	Mean (sd) or n (%)	p-value	Mean (sd) or n (%)	p-value	Mean (sd) or n (%)	p-value
Parents or another trusted adult						
Received						
From Southern U.S.	26 (15.5%)	.422	33 (19.6%)	.780	25 (14.9%)	.128
Not from Southern U.S.	20 (19.2%)		19 (18.3%)		23 (22.1%)	
Received before first sex						
From Southern U.S.	24 (96%)	.811	29 (87.9%)	.343	23 (92%)	.268
Not from Southern U.S.	17 (94.4%)		14 (77.8%)		17 (81%)	
Friends						
Received						
From Southern U.S.	77 (45.8%)	.199	67 (39.9%)	.052	64 (38.1%)	.025*
Not from Southern U.S.	56 (53.8%)		54 (51.9%)		54 (51.9%)	
Received before first sex						
From Southern U.S.	63 (94%)	.029[a]*	50 (74.6%)	.031*	46 (78%)	.311
Not from Southern U.S.	43 (81.1%)		26 (55.3%)		34 (69.4%)	
Doctor or other healthcare provider						
Received						
From Southern U.S.	55 (32.7%)	.201	103 (61.3%)	.455	42 (25%)	.169
Not from Southern U.S.	42 (40.4%)		59 (56.7%)		34 (32.7%)	
Received before first sex						
From Southern U.S.	30 (60%)	.917	55 953.9%)	.897	26 (68.4%)	.431

Not from Southern U.S.	22 (61.1%)		28 (52.8%)		19 (59.4%)	
Class or program in middle or high school						
Received						
From Southern U.S.	66 (39.3%)	<.001**	75 (44.6%)	.016*	36 (21.4%)	<.001**
Not from Southern U.S.	68 (65.4%)		62 (59.6%)		50 (48.1%)	
Received before first sex						
From Southern U.S.	63 (98.4%)	.188	72 (97.3%)	.260	34 (97.1%)	.197
Not from Southern U.S.	63 (94%)		55 (93.2%)		44 (89.8%)	
Class or program in college						
Received						
From Southern U.S.	57 (33.9%)	.382	68 (40.5%)	.741	53 (31.5%)	.600
Not from Southern U.S.	30 (28.8%)		40 (38.5%)		36 (34.6%)	
Received before first sex						
From Southern U.S.	41 (75.9%)	.052	49 (74.2%)	.140	31 (62%)	.801
Not from Southern U.S.	16 (55.2%)		21 (60%)		22 (64.7%)	
Media (e.g., Internet, TV, radio)						
Received						
From Southern U.S.	99 (58.9%)	.721	97 (57.7%)	.088	62 (36.9%)	.566
Not from Southern U.S.	59 (56.7%)		49 (47.1%)		42 (40.4%)	
Received before first sex						
From Southern U.S.	78 (82.1%)	.868	71 (75.5%)	.878	45 (76.3%)	.464
Not from Southern U.S.	47 (81%)		33 (76.7%)		25 (69.4%)	

[a]Cell in chi-square analysis has cell count <5
(*) p-value <.05, (**) p-value <.001, (--) value unavailable

Discussion

Research Question 1: To what extent are sexual health education source and number of sexual health education sources associated with sexual health knowledge and self-efficacy? Additionally, to what extent is the number of sexual health education sources associated with sexual health behavior?

An overview of all significant relationships between unique sexual health education sources and sexual health knowledge and self-efficacy can be found in Table 24.

It was predicted that, overall, sexual health education source would have a greater number of significant associations with sexual health knowledge than with sexual health self-efficacy.[28,30,42,48,49] This prediction held true: STI testing education from a doctor or other healthcare provider, the media, friends, college, and parents were all significantly associated with higher STI testing knowledge scores. However, only STI testing education from a doctor or other healthcare provider and from parents were significantly associated with STI testing self-efficacy. This trend was not observed in the context of condom use knowledge and self-efficacy, as there were no significant associations between education source and condom use knowledge. The question about condom use asked whether or not participants knew condoms were the best way to prevent STIs. The majority of participants answered this question correctly; it is possible that this knowledge is not linked to any particular education source, but may be considered common knowledge when compared to the other answer choices—hormonal birth control and the withdrawal method. The results also indicate that there may be differences in the way individuals educate young adults about STI testing as compared to condom use. Many sources of sexual health education that address STI testing may primarily focus on informing young people about which behaviors can put them at risk for STIs, while many sources of sexual health education that address condom use may focus on ensuring young people can confidently use condoms. Neither self-efficacy of partner communication about condoms nor about STI testing were significantly associated with any sources of education.

Sexual Health Education from Parents

It was predicted that sexual health education from parents would significantly improve condom use knowledge and condom use self-efficacy. [30] However, education from

parents only had a significant association with self-efficacy. This indicates that learning about condoms from parents may make young adults feel more confident in their ability to use condoms. It also indicates that the information shared by parents in this population may focus less on their purpose—relative to hormonal birth control and the withdrawal method—and more on how to properly use them. Notably, parents were the second-to-least cited source of condom use education, but they appear to be an important source. In order to improve young adults' condom use self-efficacy, more parents should be encouraged to educate their children about using condoms, as the results show that this education could be effective.

Sexual Health Education from Friends

No predictions were made about associations between receiving sexual health education from friends and sexual health knowledge or self-efficacy. However, the results showed that STI testing education from friends was significantly associated with improved STI testing knowledge. The literature showed that young adults may have low risk perception of STIs due to a lack of awareness about what types of sexual activities can lead to STI transmission.[19-21] Conversations with friends about their sexual activity and STI testing behaviors could potentially increase young adults' awareness of what types of behaviors may indicate a need for STI testing. Additionally, education from friends on partner communication was significantly associated with self-efficacy of partner communication about condom use. Research showed that young adults are likely to adopt the behaviors of their peers,[33] which could explain the relationship between learning about partner communication from friends and increased self-efficacy of partner communication. For example, if young adults are aware of their peers discussing condom use with their

partners, this could characterize partner communication as a social norm. This, in turn, may make individuals feel more comfortable discussing condom use during a sexual encounter. Therefore, education efforts should consider including the message "your peers are talking with their partners about condoms," and that they should as well.

Sexual Health Education from a Doctor or Other Healthcare Provider

It was accurately predicted that a significant association would not be observed between condom use education from a doctor or healthcare provider and condom use knowledge. This prediction was based on research that found healthcare providers are uncomfortable providing contraceptives to young adults.[34] However, the prediction that condom use education from a doctor or healthcare provider would not be associated with condom use self-efficacy was not supported. Those who learned about condom use from a healthcare provider had higher condom use self-efficacy. While there are multiple factors influencing the provision of sexual health education from a healthcare provider, time is cited as one of these barriers[36]; based on the study results, it is possible that if given enough time, providers' condom use education could potentially improve young adults' confidence in their ability to use condoms. Healthcare providers who commonly see young adult patients may benefit from enhanced training that specifically addresses providing condom use education for patients, given their potential impact on their patients' condom use self-efficacy.

It was accurately predicted that receiving STI testing education from a doctor or other healthcare provider would have a significant association with STI testing knowledge. This is likely because STI testing conversations with providers may revolve around assessing the patient's STI risk or the provision of STI testing, which may lead to

conversations about risk behaviors, thus increasing STI testing knowledge. Again, STI testing is another unique opportunity provided to physicians to educate young patients about sexual health. Sexual health educators should ensure that they are considering physicians as viable educators and design materials that can help boost physicians' confidence and technical skills in providing sexual health education.

Sexual Health Education from a Class or Program in Middle or High School

It was predicted that sexual health education from a class or program in middle or high school would significantly improve STI testing and condom use knowledge and condom use self-efficacy.[28] However, the results of this study found that school education was not associated with any of these personal determinants. Although this study did not assess the type of sexual health education curriculum participants were exposed to, one plausible interpretation is that schools may need to improve their delivery of sexual health education or utilize evidence-based sexual health curricula. It is also possible that the observed lack of significant association could be explained by students not taking sexual health education courses seriously or not retaining the information. With that said, the Department of Health and Human Services sponsors ongoing systematic reviews of teen pregnancy prevention programs to identify those that can yield favorable sexual health outcomes.[54] Improving the selection and implementation of sexual health curricula may result in improved sexual health outcomes as a result of school-based sexual health education. Additionally, ensuring trained facilitators are implementing these programs could help assure their fidelity and increase their efficacy.

Sexual Health Education from a Class or Program in College

It was accurately predicted that sexual health education from a class or program in college would significantly improve STI testing knowledge.[42] This confirms research findings that most college students believe STI information is available somewhere on their campus.[42] While research has found that college students feel that more information could be provided,[42] it appears that the information provided for those in this study was positively associated with their STI testing knowledge. Colleges could consider expanding on the informational resources they have available.

Sexual Health Education from a Religious Class or Program

No predictions were made about or associations found between sexual health education from a religious class or program and sexual health knowledge or self-efficacy. Notably, very few participants indicating receiving any type of sexual health education from a religious class or program. While some churchgoers would be interested in receiving sexual health education from religious venues,[46] most participants did not report learning something helpful from this setting. This suggests that religious settings may not be the most suitable venue for sexual health educators to focus their efforts.

Sexual Health Education from the Media

It was predicted that the media would have significant associations with both condom use knowledge and self-efficacy.[48,49] However, while media was one of the most cited sources of sexual health education by study participants, it was not significantly associated with either condom use knowledge or self-efficacy. While there may be many discussions about condom use on TV, Internet, radio, etc., those distributing this information may need to increase efforts to ensure the content is best tailored to the young adult population. This may mean utilizing educational resources that have been proven to

significantly improve condom use knowledge and self-efficacy as well as making sure the education provided is perceived as being credible and engaging by young adult viewers. The results did show that education from the media had a significant association with STI testing knowledge. This finding corroborates the results of a study that found the media can influence STI prevention knowledge.[48] The results of this study indicate that "STI prevention" may reference STI testing, specifically, and more attention should be paid to utilizing media to improve condom use knowledge and self-efficacy among young people.

Table 24. Significant Associations between Environmental and Personal Determinants of Sexual Health

Environmental Determinant	Personal Determinant
Parents or Another Trusted Adult	Condom Use Self-Efficacy[a] STI Testing Knowledge[b] STI Testing Self-Efficacy[b]
Friends	Condom Use Self-Efficacy[a] STI Testing Knowledge[b]
Doctor or Other Healthcare Provider	Condom Use Self-Efficacy[a] STI Testing Knowledge[b] STI Testing Self-Efficacy[b]
Class or Program in Middle or High School	--
Class or Program In College	STI Testing Knowledge[b]
Media (TV, Internet, etc.)	STI Testing Knowledge[b]

[a]Education from indicated source about condom use
[b]Education from indicated source about STI testing
(--) no significant associations

Number of Sexual Health Education Sources

The results of the study showed that no educational sources were independently significant with partner communication self-efficacy. However, the aggregate variable

summing number of educational sources for STI testing was significantly associated with self-efficacy of partner communication about STI testing. Additionally, only education from parents and from healthcare providers were significantly associated with partner communication behavior. However, all of the summed educational source variables were significantly associated with partner communication behavior. These trends indicate that young adults may feel more empowered to communicate with their partners if they receive this education and encouragement from multiple different sources may help characterize partner communication as a social norm. Furthermore, receiving this education from multiple sourcesIt is possible that this reinforcement might establish partner communication as an acceptable social norm that makes young adults feel more comfortable and more likely to engage in this behavior. Therefore, sexual health education materials developed for all different educators should include content about partner communication; such reiteration appears to be a potentially effective way to encourage partner communication, which has been shown to improve young adults' sexual health outcomes.[26]

Research Question 2: To what extent are sexual health knowledge, self-efficacy, education source, and education temporality associated with young adults' sexual health behavior?

An overview of all significant relationships between sexual health knowledge, self-efficacy, education source, and education temporality and sexual health behaviors can be found in Table 25.

Sexual Health Knowledge

The results showed that, as predicted, STI testing knowledge was significantly associated with STI testing behavior. This indicates that cited barriers to STI testing, such

as cost, shame, and fear of confidentiality[22] can potentially be overcome if individuals perceive themselves as being at risk for an STI based on their sexual activities. No other predictions were made about associations between STI testing knowledge and sexual health behaviors. However, STI testing knowledge was also associated with partner communication about STI testing. This indicates that knowing risk factors that suggest a need for STI testing may also encourage individuals to assess their partners' risk before engaging in a sexual activity. The extent to which STI testing knowledge appears to be positively associated with sexual health behavior is a key takeaway for those selecting content for sexual health educational materials. Given the ability to assess risk, young adults are able to make positive sexual health choices with regard to STI testing behavior.

Notably, no associations were observed between condom use knowledge and sexual health behavior. This indicates, that knowledge alone is not enough to influence behavior; therefore, ensuring that other personal determinants, such as self-efficacy, are developed should continue to be an important component of sexual health education development.

Sexual Health Self-Efficacy

The results showed that, as predicted, STI testing self-efficacy is also significantly associated with STI testing behavior. Not only does an individual have to recognize that they are at risk for an STI, but they may also need to feel comfortable with and confident in their ability to approach their doctor or other healthcare provider to ask for an STI test. This puts a certain level of responsibility on healthcare providers as well to play a role in sexual health education in the exam room, even just as a resource for STI testing. No other predictions were made about STI testing self-efficacy and sexual health behavior. However, as with STI testing knowledge, STI testing self-efficacy was also associated with partner

communication about STI testing. Overall, those who have greater awareness of their STI risk and are comfortable seeking STI testing services, may be likely to seek the testing they need and ensure they are not putting themselves or others at risk by having conversations about STIs with their sexual partner(s). However, the temporality of knowing one's STI risk vs. seeking services or talking to partners about STI testing was not established in this study. It is possible that those who have been STI tested feel more self-efficacious regarding STI testing after being tested and going through the process of testing; experience and practice could result in enhanced self-efficacy.

Contrary to what was predicted, condom use self-efficacy was not found to be associated with condom use behavior for any type of sexual activity. Confidence in one's ability to use condoms alone is insufficient to ensure condom use. However, it was also found that condom use self-efficacy was significantly associated with STI testing behavior, partner communication about condom use, and partner communication about STI testing. This indicates that those who are confident in their ability to use condoms, and thus may be more empowered in their sexual health, are more likely to exhibit this control by getting STI tested and ensuring their partners respect their sexual health by engaging them in conversations about safe sex.

Overall, it appears that STI testing behavior is sought by individuals who already feel confident in their ability to take control of their sexual health. This confidence may allow them to ask their partners about STIs and request STI tests from their healthcare providers. However, within this study, neither STI testing nor condom use self-efficacy were sufficient to influence condom use behavior during a sexual encounter. Condom use education and skills-building may not improve condom use behavior alone. Instead

multiple factors influence young adults' condom use behavior, including partner communication. Therefore, sexual health educators should also ensure they prepare young adults' to talk to their partners about using condoms.

It was correctly predicted that partner communication self-efficacy about condom use is significantly associated with condom use behavior, as well as with reported partner communication about condom use. Partner communication self-efficacy about condom use was associated with increased condom use during vaginal and anal sex—nearly all participants never used a condom during oral sex. However, those who were able to talk to their partner(s) about using condoms reported more use of condoms during vaginal and anal sex, reflecting the findings of additional studies examining the effects of communication before having sex.[5] Further, those who feel confident in their ability to discuss condoms with their partner will do so. However, an additional association was also found that was not predicted: those who feel confident in their ability to talk to their partners about STI testing are more likely to be STI tested themselves. This falls in line with the finding already noted that those who feel they have more control over their sexual health—such as the confidence to discuss STI testing with their partner—are more likely to engage in positive sexual health behavior. Training young adults to be vocal and empowered in their sexual encounters appears to have a positive effect on their sexual health decision-making—an important consideration when prioritizing sexual health education topics for young adults.

Sexual Health Education Source

It was incorrectly predicted that condom use education from friends would influence condom use behavior. In fact, receiving education from friends—as opposed to

not receiving education from friends—was not significantly associated with any sexual health behavior, including STI testing behavior and partner communication about condom use and STI testing, which were also predicted. While significant relationships are observed between sexual health education from friends and certain personal determinants of sexual health, education from friends was not associated with any behavioral determinants. This indicates that friends may serve to supplement young adults' knowledge, but young adults appear to benefit more from receiving education from other sources in terms of translating this knowledge into positive sexual health behaviors. Similarly, it was predicted that media would be significantly associated with condom use and STI testing behaviors. Yet, media was not associated with any sexual health behaviors.

It was correctly predicted that STI testing education from a doctor or other healthcare provider would be significantly associated with STI testing behavior, likely due to the same reason STI testing education from a doctor is significantly associated with STI testing knowledge—STI testing occurs with a healthcare provider.

Unpredicted relationships were also seen. First, those who received condom use education from parents or another trusted adult were *less* likely to use condoms during oral sex. Literature suggests that many individuals do not consider oral sex as having "had sex." [20,21] It is possible that this relationship is due to social norms that stress condom use during vaginal sex, but not during oral sex, as evidenced by the low number of participants who use condoms during oral sex. In fact, literature shows that parents typically do not address oral sex at all in sexual health conversations with their children.[30] The absence of the topic of condom use during oral sex during a condom use conversation may send the message that condoms do not need to be used during oral sex, more so than not hearing

about condom use at all. When developing sexual health education materials, public health professionals should consider focusing efforts to improve sexual health knowledge of parents—as well as young adults—and help improve their self-efficacy to talk to their children about sexual health. Education from parents was also associated with partner communication. Specifically, those who received partner communication education from parents were more likely to talk about STI testing with their partner(s). In this study, while parents do not seem to have a significant influence on condom use or STI testing behaviors directly, they are able to encourage their children to better communicate with their partner(s).

Also unpredicted, was the association between receiving condom use education from a class or program in college and condom use during vaginal sex. College students cite condoms as being one of the most widely available sexual health resources on their campus.[42] The provision of condoms on campuses may encourage students to utilize them. Given that the majority of this sample was women who have sex exclusively with men, it is expected that a correlation between condom use education from college and condom use behavior would likely affect vaginal sex, specifically. Colleges should continue providing condoms and condom use education; however it is possible that young adults could benefit if colleges expand their messaging to include promoting condom use during oral and anal sex as well.

In summary, the following associations were found: condom use from a class or program in college can increase condom use during vaginal sex, STI testing education from a doctor or other healthcare provider can increase STI testing, and partner communication education from parents or another trusted adult can increase partner communication

about STI testing. These specifics are important to note, as they can help colleges, healthcare providers, and parents determine which aspects of sexual health education to focus on based on what young adults are most responsive to from each particular source.

Sexual Health Education Temporality

No predictions were made about the effects of receiving sexual health education before vs. after one's first sexual encounter. However, several associations were found. Those who learned about condom use from a doctor or other healthcare provider before their first sexual encounter were more likely to use a condom during vaginal sex. This was also true for partner communication about condom use; those who learned about partner communication from a doctor or other healthcare provider before the first time they had sex were more likely to discuss condom use with their partner(s). As noted, the majority of young adults did not indicate receiving condom use or partner communication education from a doctor or other healthcare provider; however, according to these results, if doctors do discuss condom use with their patients, and do so early on, they could have a positive impact on their patients' adoption of safe sexual health behavior. Additionally, those who received condom use education from a class or program in middle or high school before their first sexual encounter were significantly more likely to use a condom during anal sex than those who received this education after their first sexual encounter. Notably, those who received condom use education from a class or program in middle or high school before their first sexual encounter used condoms more during oral, vaginal, and anal sex than those who received this education after—only anal sex demonstrated a statistically significant difference. It is possible that those engaging in riskier or more 'taboo' sexual behaviors are more cautious or receptive to learning how to be safe; however, additional

research is needed to understand differences in application of sexual health education to different types of sexual activities.

Significant associations were also observed between temporality of STI testing education and STI testing behavior. Those who learned about STI testing from parents, friends, or a class or program in college before their first sexual encounter were more likely to be STI tested than those who learned after their first sexual encounter. Just receiving education from these sources was not associated with STI testing. This indicates that overall, education from these sources is not especially influential on STI testing, but if these sources do provide this education, they should attempt to provide this education before young adults first become sexually active. Additionally, it was noted that receiving STI testing education from doctors or other healthcare providers increases likelihood of STI testing; however, there was also a significant association between receiving this education *after* first sexual encounter and STI testing. Unlike for the other temporality of STI testing education sources, STI testing education from doctors is most strongly associated with STI testing behavior if it occurs after young adults become sexually active. This is likely because they now perceive it as relevant now that they are sexually active and may be more likely to seek information from a doctor or be more receptive to information provided by a doctor about STI testing, especially if the education is occurring within the context of receiving an STI test.

Multivariate Analyses

The results of the multivariate analyses served to understand how different personal and environmental determinants interacted with behavioral determinants when controlling for demographic and additional predictor variables.

No personal or environmental determinants influenced condom use during oral or anal sex within their respective models. While condom use education from parents or another trusted adult had an independently significant association with decreased condom use during oral sex, when controlling for STI history, this association no longer existed. Similarly, while condom use education from middle or high school had an independently significant association with condom use during anal sex, when controlling for gender, race, sexual preference, and birth control use, this association no longer existed. Additional research needs to be done to further explore the influence of these education sources on condom use behavior and how sexual history and personal characteristics may predict an individual's sexual health behavior in spite of education they may have received. For vaginal sex, however, condom use education from a class or program in college was the only significantly associated personal or environmental determinant in the model. This finding is notable, as over 70% of young adult men and women have engaged in vaginal sex,[7] as well as the majority of participants in this study. Condom use during vaginal sex is therefore a highly important protective behavior this population and others like it should adopt. Based on these results, increased condom use education in colleges could have a notable impact on reducing STI transmission risk among the young adult population.

Results of the multiple logistic regression showed that when controlling for select participant demographics, STI testing knowledge, STI testing self-efficacy, temporality of STI testing education from friends, and STI testing education from a doctor or other healthcare provider remained significantly associated with STI testing behavior. This indicates, that each of these factors has an important role in young adults' STI testing behavior. Notably, contextual differences around STI testing education from friends

compared to STI testing from a healthcare provider may explain these two relationships. In the case of receiving education from a healthcare provider, participants likely have to discuss STI testing with a doctor before being tested, which may indicate STI testing education is shared as a necessity. On the other hand, education from peers is likely involuntary and may occur through informal conversations; therefore, it is not only important to ensure healthcare providers are regularly reviewing information about STI testing during a visit, but also educators should ensure that knowledge about STI testing is widespread among peer groups who may be sharing this information amongst one another.

Results of the multiple linear regression showed that when controlling for birth control use, both self-efficacy of partner communication about condom use and temporality of condom use education from a doctor or other healthcare provider remained significantly associated with partner communication about condom use. One limitation in this study was that partner type (e.g., new, steady, lifelong, etc.) information was not obtained. However, the finding that some individuals were still likely to discuss condom use with their partners despite using birth control indicates that even if individuals are not concerned about pregnancy, they may still be aware of STI risk. It is important to reiterate this point in sexual health education materials: that even if an individual is on birth control, they may still be at risk for STIs, especially when engaging in a sexual encounter with a new partner.

Finally, results of the multiple logistic regression showed that when controlling for select demographics, STI testing knowledge and self-efficacy of partner communication about STI testing are both significantly associated with partner communication about STI testing. As seen in both this and in the previously discussed regression, partner communication self-efficacy is an important predictor of partner communication behavior.

Those providing sexual health education to young adults should therefore focus efforts on providing young adults with the tools they need to build confidence in their communication skills. As noted, increased partner communication can lead to better sexual health outcomes.[26]

Table 25. Significant Associations between Personal and Environmental Determinants and Behavioral Determinants of Sexual Health

Personal or Environmental Determinant	Behavioral Determinant
Condom Use Knowledge	--
Condom Use Self-Efficacy	STI Testing Partner Communication about Condom Use Partner Communication about STI Testing
STI Testing Knowledge	STI Testing Partner Communication about STI Testing
STI Testing Self-Efficacy	STI Testing Partner Communication about STI Testing
Self-Efficacy of Partner Communication about Condom Use	Condom Use During Vaginal Sex Condom Use During Anal Sex Partner Communication about Condom Use
Self-Efficacy of Partner Communication about STI Testing	Partner Communication about STI Testing
Education from Parents or Another Trusted Adult	Decreased Condom Use During Oral Sex[a] Partner Communication about STI Testing[c]
Education from Parents or Another Trusted Adult Before First Sexual Encounter	STI Testing[b]
Education from Friends	--
Education from Friends Before First Sexual Encounter	STI Testing[b]
Education from a Doctor or Other Healthcare Provider	STI Testing[b]
Education from a Doctor or Other Healthcare Provider Before First Sexual Encounter	Condom Use During Vaginal Sex[a] Decreased STI Testing[b] Partner Communication about Condom Use[c]

Education from a Class or Program in Middle or High School	--
Education from a Class or Program in Middle or High School Before First Sexual Encounter	Condom Use During Anal Sex[a]
Education from a Class or Program in College	Condom Use During Vaginal Sex[a]
Education from a Class or Program in College Before First Sexual Encounter	STI Testing[b]
Education from Media (TV, Internet, etc.)	--
Education from Media (TV, Internet, etc.)	--

[a]Education from indicated source about condom use
[b]Education from indicated source about STI testing
[c]Education from indicated source about partner communication
(--) no significant associations

Reciprocal determinism

This study was developed around the three major constructs of SCT: personal, environmental, and behavioral determinants and the reciprocal determinism demonstrated between these constructs. Figure 3 illustrates instances of reciprocal determinism between significantly associated determinants. However, the figure does not distinguish between temporality of or type of education provided by each education source considered as an environmental determinant. Each environmental determinant is to be considered as receiving sexual health education from that source in general.

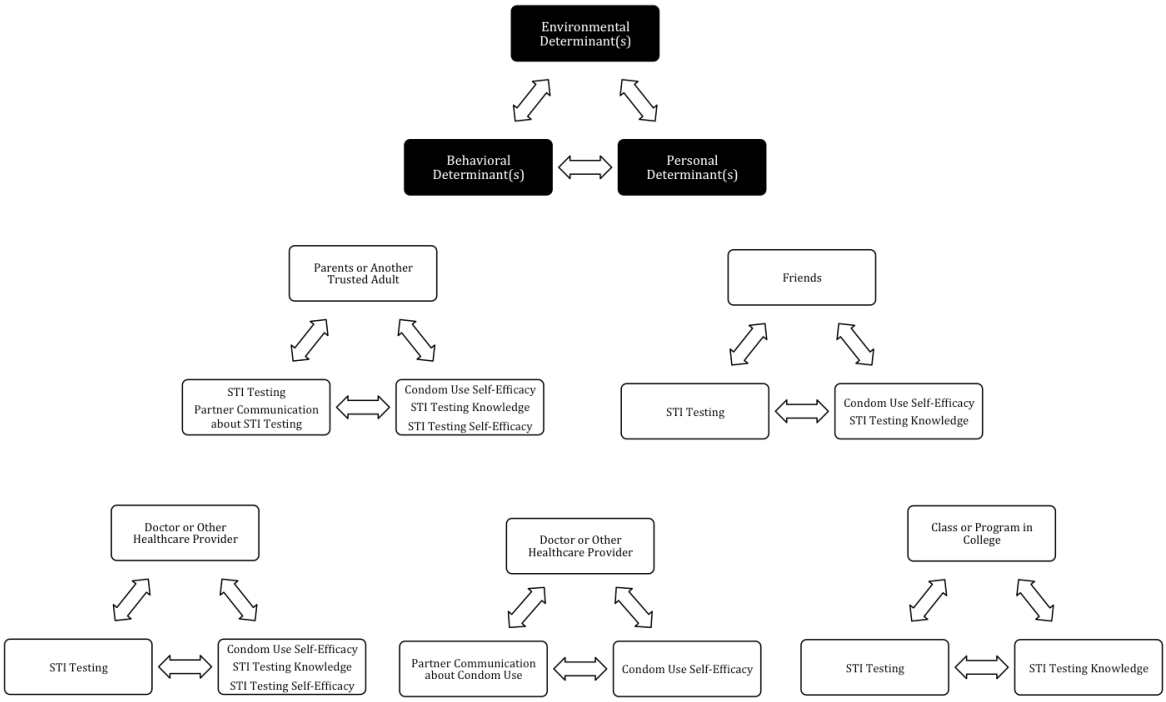

Figure 3. Significant Instances of Reciprocal Determinism

Five instances of reciprocal determinism were observed. Four of these instances demonstrated reciprocal determinism with STI testing behavior, one with partner communication about condom use, and one with partner communication about STI testing. Notably, there were no instances of reciprocal determinism for condom use behavior. This highlights an important gap in sexual health education. Sexual health education sources should re-focus their efforts to include the personal determinants that demonstrated a significant influence on condom use behavior, specifically self-efficacy of partner communication about condom use.

Exploratory Aim: Do differences in sexual health knowledge, self-efficacy, behavior, educational source, and/or education temporality exist between individuals from the Southern U.S. vs. other areas of the U.S.?

It was predicted that those from the Southern U.S. would have lower STI testing and condom use knowledge than those not from the Southern U.S. and that those from the Southern U.S. would have less education from a class or program in middle or high school than those not from the Southern U.S. However, no significant associations were found between geography and any personal determinants of sexual health. However, it was correctly predicted that those from the Southern U.S. received significantly less condom use, STI testing, and partner communication education from a class or program in middle or high school than those not from the Southern U.S. Those from the Southern U.S. were also significantly less likely to receive partner communication education from friends. No predictions were made about geography and temporality of sexual health education. However, the results showed that those from the Southern U.S. who learned about condom use and STI testing from friends were more likely to receive this education before their first sexual encounter than those not from the Southern U.S. This indicates that those in the Southern U.S. are likely to discuss sexual health with their peers earlier than those not from the Southern U.S. It is possible that young adults discussing sexual health with their peers is a response to a lack of sexual health education in schools—young adults may be relying on each other for sexual health information.

Overall, those from the Southern U.S. have the same sexual health knowledge, self-efficacy, and behavior as those not from the Southern U.S. and significantly less sexual health education acquired from school-based education. Notably, those from the Southern U.S. are also significantly more likely to have ever had an STI, which reflects national trends that show the South has the highest rates of both chlamydia and gonorrhea.[2] This indicates that there may be additional factors influencing the study population that are resulting in

significantly higher STI rates. One possibility is that the high STI rates in the South put those living in the South at higher risk of having a sexual encounter with a person who has an STI. In order to combat these high STI rates, it may be important to improve sexual health knowledge and self-efficacy even beyond the levels observed in other parts of the U.S. In order to achieve this, current sexual health policies in the Southern U.S. that do not mandate inclusion of information about STIs, condom use or contraception[37] may need to reconsider their policies. Overall, additional efforts should be made to improve STI testing knowledge and condom use self-efficacy, in particular, in order to combat the disproportionately high STI rates observed in the Southern. U.S. population.

Strengths & Limitations

This study had both significant strengths and limitations. As a cross-sectional study, the results may not be generalizable to other populations, including those who were outside of the range of eligible ages and those who have not had a college education. Education eligibility criteria may have biased the sample towards those with higher education, which may have positively impacted the participants' overall sexual health knowledge, behavior, and STI history. The majority of participants were white, female, and/or had sex exclusively with men, reducing the results' generalizability to other races, genders, and sexualities. Minority women, men, and LGBTQ+ individuals may have different sexual health knowledge, efficacy, and behaviors that were not well-represented in this study. Generalizability could have also been hindered by an additional limitation of the study, which was the sampling method. Because participants were recruited via the PI's social network, it is likely that most participants had similar backgrounds as well as similar answers to the survey questions. Snowball sampling may have further homogenized the

group, as individuals contacted by those in the PI's network may have displayed the same similarities as those directly in the PI's network. Additionally, all responses were based on self-reported data, which, due to the personal nature of these questions, may be skewed as a result of social desirability bias. Additional limitations were present in the analysis. A large number statistical tests run within a 95% confidence interval, leaving room for error among 5% of tests; no correctional analyses were conducted, meaning that these potential errors may have affected the results. Finally, this study was limited to collecting information about condom use, STI testing, and partner communication knowledge and self-efficacy, but did not assess other personal and social determinants that may have influenced sexual health behavior and/or education.

With that said, one of the strengths of this study was its ability to contextualize sexual health education not only by source and type of education, but also by temporality. The results showed differences in associations based on both receipt of education and temporality, indicating that this was an important distinction to make. Understanding how unique and number of unique sources affect personal and behavioral determinants was also a significant strength because this information can allow public health professionals to better focus their efforts when developing sexual health education materials for different educators. Another strength of this study was the parsing out of variables to separately address condom use, STI, and partner communication knowledge and self-efficacy instead of combining these variables together. This allowed for a closer examination of inter-determinant interactions. Finally, while self-report was an indicated limitation, online computer administration may have increased honest reporting of sensitive information, decreasing social desirability bias.

Conclusion

Implications & Future Directions

Overall, it appears that sexual health education as it stands is most effective at improving STI testing behavior among young adults. However, it appears that a gap still exists in providing education that can effectively encourage young adults to use condoms and avoid STI transmission generally. Based on education sources whose education was indicated as being most effective, efforts made to improve the personal determinants of sexual health should focus on engaging healthcare providers and parents, both of whom already exhibit influence on sexual health knowledge and self-efficacy. Perhaps providing enhanced breadth and depth of training to these individuals could better translate to improved condom use behavior among young people. Additionally, efforts should be focused towards implementing evidence-based sexual health curricula in schools to improve the quality of school education and ensure that young adults are receiving correct information that, research shows,[28,29] they are sharing with their friends. As college was found to be significantly associated with improved sexual health behavior, continuing this education throughout college could be a beneficial way to keep spreading this information, particularly as more young people become sexually active and the education becomes more relevant. Understanding the ways in which individual education sources can best improve knowledge, self-efficacy, and behavior can help these sources appropriately target their efforts. However, it is also important to note that being exposed to multiple sources of education was significantly associated with increased knowledge, self-efficacy, and communication. Engaging multiple sources in educating young people could be an effective strategy. First, because reinforcing messages may be beneficial; and secondly, because if

young adults are unable to access one or more of these sources, other ones can potentially fill in the gaps.

When it comes to sexual health, young adults appear to be less receptive to the question, "What do I need to do?," and prefer to ask, "Why do I need to do it?" They understand what behaviors put them at risk for STIs and appear to be receptive to education that encourages them to seek testing. However, sexual health educators need to focus on prevention—teaching young adults "What they need to do" in order to avoid contracting STIs is still necessary. In order to reduce the disproportionately high STI rates among young adults, young adults need to be continually encouraged to prevent and not just diagnose and treat STIs. Continuing to address risk as well as providing young adults with the tools they need to reduce risk consistently via multiple health education fronts (from peers, parents, schools, providers and media), and especially so before they become sexually active, may be the most effective way to reduce the heavy STI burden carried by young people in the U.S. today.

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Appendix A: Participant Survey

Welcome to My Survey!

Exploring the Influence of Sexual Health Education on Young Adults: A Social-Cognitive Theory-Driven Assessment

Principal Investigator (PI): Ashley Phillips, BA
Department of Behavioral Sciences and Health Education,
Rollins School of Public Health, Emory University, Atlanta, GA

You are being asked to be in a research study. This form is designed to tell you everything you need to think about before you decide to consent (agree) to be in the study or not to be in the study. It is entirely your choice. If you decide to take part, you can change your mind later on and withdraw from the research study. You can skip any questions that you do not wish to answer.

Before making your decision, please carefully read this form or have it read to you and please contact the PI at **ashley.phillips4@emory.edu** for questions about anything that is not clear.

You may print a copy of this page to keep. Feel free to take your time thinking about whether you would like to participate. By agreeing to participate in this study, you will not give up any legal rights.

Study Overview

The purpose of this study is to explore to what extent sexual health knowledge, self-efficacy, and education relate to sexual health behavior.

If you choose to participate, you will complete the following survey. It should take no more than 10 minutes to complete.

Risks and Discomforts

You may feel uncomfortable answering questions about your sex life. However, all of your answers will remain anonymous and no personal identifiers will link you to your responses. You can choose not to answer any question and can stop the survey at any time.

Benefits

This study is not designed to benefit you directly. This study is designed to learn more about the influence of sexual health knowledge, self-efficacy, and education on young adults' sexual health behavior. However, we may learn new things that could be used to help improve sexual health education in the future.

Compensation

You will not be offered payment for being in this study.

Confidentiality

Certain offices and people other than the researchers may look at study records. Government agencies and Emory employees overseeing proper study conduct may look at the study records. These offices include the Office for Human Research Protections, the Emory Institutional Review Board, and the Emory Office of Research Compliance. Emory will keep any research records we create private to the extent we are required to do so by law. A study number will be used on all study records. You will not be identified in any way when we present this study or publish its results.

Study records can be opened by court order. They may also be produced in response to a subpoena or a request for production of documents.

Contact Information

Contact Ashley Phillips at ashley.phillips4@emory.edu

(1) if you have any questions about this study or your part in it,

(2) if you have questions, concerns or complaints about the research

Contact the Emory Institutional Review Board at 404-712-0720 or 877-503-9797 or irb@emory.edu:

(1) if you have questions about your rights as a research participant.
(2) if you have questions, concerns or complaints about the research.

You may also let the IRB know about your experience as a research

* 1. Do you agree to participate in this study? By selecting "yes," you are agreeing to participate in this study.

- ◯ Yes
- ◯ No

* 2. Are you between 18 and 24 years old?

- ◯ Yes
- ◯ No

* 3. In what U.S. state did you complete the majority of middle and high school?

* 4. Are you currently attending or have you previously attended a four-year college or university?

- ◯ Yes
- ◯ No

* 5. Have you ever participated in any of the following sexual activities? (Check all that apply)

- ☐ Oral sex (given/received)
- ☐ Vaginal sex
- ☐ Anal sex
- ☐ I have not participated in any of these sexual activities.

* 6. How old are you?

* 7. What is your gender?

- Female
- Male
- Transgender
- Prefer not to answer
- Other (please specify)

* 8. Are you Hispanic/Latino?

- Yes
- No
- Prefer not to answer

* 9. What is your race?

- White
- Black/African-American
- Asian
- American Indian or Alaska Native
- Native Hawaiian or Pacific Islander
- Prefer not to answer
- Other (please specify)

* 10. Who do you usually have sex with (oral, vaginal, and/or anal sex)?

- ◯ Exclusively men
- ◯ Both men and women
- ◯ Exclusively women
- ◯ Prefer not to answer
- ◯ Other (please specify)

* 11. How old were you when you first had vaginal sex?

* 12. Have you had more than one sexual partner in your lifetime (oral, vaginal, and/or anal sex)?

- ◯ Yes
- ◯ No
- ◯ Prefer not to answer

* 13. Have you had more than one sexual partner in the past 12 months (oral, vaginal, and/or anal sex)?

- ◯ Yes
- ◯ No
- ◯ Prefer not to answer

* 14. Do you or your most recent sexual partner(s) use any form of birth control other than condoms?

- ◯ Yes
- ◯ No
- ◯ Prefer not to answer

* 15. Have you ever had an STD?

- ◯ Yes
- ◯ No
- ◯ I don't know/I don't remember
- ◯ Prefer not to answer

Please indicate how much you agree or disagree with the following statements.

* 16. I feel confident in my ability to put a condom on myself or my partner(s).

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

* 17. I feel confident in my ability to use a condom correctly.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

* 18. I feel confident in my ability to put a condom on myself or my partner(s) quickly.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

Please indicate how much you agree or disagree with the following statements.

* 19. I feel confident that I can ask my partner(s) to use a condom.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

* 20. I feel confident that I can ask my partner(s) to get tested for STDs.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

* 21. I feel confident that I can ask my doctor or healthcare provider for STD testing.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

* 22. I think you can get an STD by:
(Check all that apply)

- [ ] Kissing
- [ ] Giving or receiving oral sex
- [ ] Having vaginal sex
- [ ] Having anal sex
- [ ] I don't think you can get an STD by participating in any of these activities.

* 23. I think the following people should get STD tested:
(Check all that apply)

- [ ] People who have only one sexual partner
- [ ] People who have had multiple sexual partners in their life
- [ ] People who have multiple sexual partners at the same time
- [ ] People who have sexual intercourse
- [ ] People who have oral sex
- [ ] People who have anal sex
- [ ] I don't think any of these people should get STD tested.

* 24. I think _____ offers the best protection against STDs.

- ( ) Pulling out
- ( ) Hormonal birth control
- ( ) A latex condom
- ( ) I don't know

For the following questions, please think about your most recent sexual partner(s).

* 25. In general, how often do you talk to your partner(s) about using condoms?

Never	Some of the time	Most of the time	All of the time	Prefer not to answer
○	○	○	○	○

* 26. In general, when you give/receive oral sex, how often do you use a condom?

Never	Some of the time	Most of the time	All of the time	Prefer not to answer	I have never participated in this activity.
○	○	○	○	○	○

* 27. In general, when you have vaginal sex, how often do you use a condom?

Never	Some of the time	Most of the time	All of the time	Prefer not to answer	I have never participated in this activity.
○	○	○	○	○	○

* 28. In general, when you have anal sex, how often do you use a condom?

Never	Some of the time	Most of the time	All of the time	Prefer not to answer	I have never participated in this activity.
○	○	○	○	○	○

For the following questions, please think about your most recent sexual partner(s).

* 29. Have you ever asked your partner(s) if they have ever been tested for STDs?

- ◯ Yes
- ◯ No
- ◯ I don't remember
- ◯ Prefer not to answer

* 30. Have you ever been tested for STDs?

- ◯ Yes
- ◯ No
- ◯ I don't remember
- ◯ Prefer not to answer

* 31. I have learned something helpful about using condoms from:
(Check all that apply)

- [ ] My parents or another trusted adult
- [ ] My friends
- [ ] My doctor or other healthcare provider
- [ ] A class or program in middle or high school
- [ ] A class or program in college
- [ ] A religious class or program
- [ ] Media (e.g., Internet, TV, radio)
- [ ] I have never learned something helpful about using condoms from anybody
- [ ] Other (please specify)

* 32. Did you learn about using condoms from these sources before or after the first time you had sex?

	Before	After	I don't remember
My parents or another trusted adult	○	○	○
My friends	○	○	○
My doctor or other healthcare provider	○	○	○
A class or program in middle or high school	○	○	○
A class or program in college	○	○	○
A religious class or program	○	○	○
Media (e.g., Internet, TV, radio)	○	○	○
[Insert text from Other]	○	○	○

* 33. I have learned something helpful about STD testing from:
(Check all that apply)

- [ ] My parents or another trusted adult
- [ ] My friends
- [ ] My doctor or other healthcare provider
- [ ] A class or program in middle or high school
- [ ] A class or program in college
- [ ] A religious class or program
- [ ] Media (e.g., Internet, TV, radio)
- [ ] I have never learned something helpful about STD testing from anybody
- [ ] Other (please specify)

* 34. Did you learn about STD testing from these sources before or after the first time you had sex?

	Before	After	I don't remember
My parents or another trusted adult	○	○	○
My friends	○	○	○
My doctor or other healthcare provider	○	○	○
A class or program in middle or high school	○	○	○
A class or program in college	○	○	○
A religious class or program	○	○	○
Media (e.g., Internet, TV, radio)	○	○	○
[Insert text from Other]	○	○	○

* 35. I have learned something helpful about talking to my sexual partner(s) about sexual health (condoms or STD testing) from:
(Check all that apply)

- [ ] My parents or another trusted adult
- [ ] My friends
- [ ] My doctor or other healthcare provider
- [ ] A class or program in middle or high school
- [ ] A class or program in college
- [ ] A religious class or program
- [ ] Media (e.g., Internet, TV, radio)
- [ ] I have never learned something helpful about talking to my sexual partner(s) about sexual health from anybody
- [ ] Other (please specify)

* 36. Did you learn about talking to your sexual partner(s) about sexual health (condoms or STD testing) before or after the first time you had sex?

	Before	After	I don't remember
My parents or another trusted adult	○	○	○
My friends	○	○	○
My doctor or other healthcare provider	○	○	○
A class or program in middle or high school	○	○	○
A class or program in college	○	○	○
A religious class or program	○	○	○
Media (e.g., Internet, TV, radio)	○	○	○
[Insert text from Other]	○	○	○

* 37. Did learning about talking to your sexual partner(s) from these sources make you feel more comfortable talking to your sexual partner(s) about sexual health?

	Yes	No	I don't know
My parents or another trusted adult	○	○	○
My friends	○	○	○
My doctor or other healthcare provider	○	○	○
A class or program in middle or high school	○	○	○
A class or program in college	○	○	○
A religious class or program	○	○	○
Media (e.g., Internet, TV, radio)	○	○	○
[Insert text from Other]	○	○	○

Thank you very much for considering participating in this study. Please feel free to share this survey with anyone else you think may be interested in completing it using the following link:

https://www.surveymonkey.com/r/APTHESIS

Have a nice day!

Thank you very much for your interest in taking this survey. Unfortunately, you do not meet the qualifications for this study and will not be able to proceed. Your time and effort is much appreciated.

Please feel free to share the survey with anyone you think may be interested in completing it using the following link: https://www.surveymonkey.com/r/APTHESIS

Have a nice day!

Thank you very much for your participation in this survey. Your time and effort is greatly appreciated. Please feel free to share this survey with anyone else you think may be interested in completing it using the following link:

https://www.surveymonkey.com/r/APTHESIS

As a reminder, if you have any questions about the survey, your role as a participant, or the study as a whole, please contact ashley.phillips4@emory.edu.

If you have any questions about your rights as a research participant, you may contact the Emory Institutional Review Board at irb@emory.edu.

You may also let the IRB know about your experience as a research participant though the Research Participant Survey at http://www.surveymonkey.com/s/6ZDMW75.

Have a nice day!