Abstract

Demographic Differences in Access to Formal Sex Education in the United States
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This paper examines differences in access to formal sex education among adolescents in the United States by demographic characteristics. Previous research has found disparities in access to sex education by demographic, though this issue has not been examined thoroughly in recent years (Kohler, Manhart, and Lafferty 2008; Lindberg, Maddow-Zimet, and Boonstra 2016; Lindberg, Santelli, and Singh 2006). Research has additionally suggested that variation in average age at first sexual experience explains the different rates at which different demographic groups report receiving sex education before first sex (Lindberg, Ku, and Sonenstein 2000; Lindberg et al. 2016). Due to a lack of available data, researchers have been unable to distinguish between the different messages adolescents receive about delaying sexual activity. In this study, I describe demographic predictors of receipt of formal sex education using logistic regression models. I consider timing of sex education relative to first sex as it differs by demographic group. I also examine differences between adolescents who report learning "how to say no to sex" and those who report learning about "waiting until marriage to have sex." I find consistently low rates of receipt of education about safe sex practices such as where to obtain birth control and how to use a condom. The lowest rates of formal sex education are among females, low-income adolescents, and those who do not complete high school.

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Figures

Introduction

Sex education is a controversial topic in the United States. Public debate concerns whether students should be taught about specific sexual health skills, and at what ages they should learn about sexuality. Advocates of comprehensive sex education argue that adolescents should be taught about safe sex, while advocates of abstinence-only education argue that adolescents should only be taught the importance of abstaining from sex. The controversy persists despite the fact that the U.S. has higher rates of teen pregnancy and sexually transmitted diseases (STDs) than most other developed nations (Panchaud et al. 2000; Sedgh et al. 2015). Because of a lack of consistent policy or standards for sex education in the U.S., different adolescents often receive different types of instruction about sexuality, with differences occurring even between students in the same school (Kendall 2013). Because of this variation, it is necessary to understand which adolescents are most likely to receive sex education, what topics they learn about, and when they receive that instruction.

Previous research has found different rates of reported receipt of sex education by demographic traits such as gender and race (Kohler et al. 2008; Lindberg et al. 2016, 2006). However, public health research has emphasized behavioral outcomes without fully examining the current state of sex education and some of its broad-reaching consequences (Kendall 2013). Sociology research has critiqued the content and "hidden curriculum" of sex education, meaning the explicit and implicit messages which students receive about what normal and healthy sexuality is. Scholars have used ethnographic and other qualitative methodologies to inform these analyses, in the absence of quantitative research about who receives different types of sex education (Connell and Elliott 2009; Fields 2008; Fine 1988; Fine and McClelland 2006).

Furthermore, much of the quantitative research about sex education has excluded large numbers of adolescents from the sample, such as pregnant and queer respondents, as well as respondents who learn about birth control but not abstinence (Espinoza 2019; Kohler et al. 2008; Lindberg and Maddow-Zimet 2012). Behavior-focused research typically excludes respondents who have not had vaginal intercourse or who are married (Donaldson et al. 2013; Jaramillo et al. 2017).

Quantitative research about sex education often uses the National Survey of Family Growth, one of the only nationally representative surveys to ask about sex education. The measures contained in this survey therefore have limited the available information about sex education. Until 2011, the only question the survey contained about abstinence education asked whether a respondent received "any formal instruction at school, church, a community center, or some other place about how to say no to sex" (U.S. Department of Health and Human Services 2018). Since many abstinence education programs are aimed at delaying sexual activity until marriage, this question does not measure receipt of abstinence education as it is commonly understood in the political climate (Kendall 2013; Luker 2007; Santelli et al. 2017). In 2011, the National Survey of Family Growth added a question asking respondents whether they received instruction about "waiting until marriage to have sex." Responses to the new question allow for a more nuanced analysis of the messages adolescents receive about sexuality. Another limitation of the National Survey of Family Growth is that until 2015, it only asked about receipt of education in these topics from any formal source, "such as a school, church, or a community center." Most researchers assumed that this education happened primarily in schools. In the most recent set of surveys from 2015–2017, respondents who reported learning about birth control and about waiting until marriage to have sex from formal sources were also asked about the specific

source of that instruction, so researchers no longer need to rely on the assumption that most formal sex education happens in schools.

In this analysis, I use data from the National Survey of Family Growth to provide updated estimates of the proportion of adolescents receiving sex education in a variety of topics from formal sources, and analyze disparities in that education based on demographic factors. I consider age at first instruction relative to first sex, and compare proportions of adolescents learning about each topic before first sex by demographic group. I also utilize the new measures made available in the 2015–2017 surveys to draw new conclusions about access to sex education. For birth control and abstinence until marriage, I estimate the proportion of adolescents who learn about these topics in schools as opposed to from other formal sources. Additionally, I use multinomial logistic regression to compare the likelihood of adolescents in different demographic groups to learn about different abstinence topics.

In this analysis, I ask three questions about sex education in the United States. First, *which demographic groups are receiving sex education?* Secondly, *which demographic groups are receiving sex education before they become sexually active?* And finally, *which demographic groups receive formal messages about waiting until marriage to have sex and which receive formal messages about how to say no to sex?* I aim to answer these questions without excluding subgroups of the population, and to give new insight into the messages adolescents receive from formal sources by using new measures.

Literature Review

The prevalence of sex education increased during the end of the twentieth century, but research indicates that the rate has declined since 1995 (Lindberg et al. 2016, 2006; Zimmerman 2015). According to estimates from 2011–2013 using the National Survey of Family Growth, 60% percent of 15–19 year old females and 55% of 15–19 year old males reported learning about methods of birth control from formal sources (Lindberg et al. 2016). This is compared to 87% of females and 81% of males in 1995 (Lindberg et al. 2006). Some research has identified sex education as a potential causal mechanism for reducing sexual risk behaviors and outcomes among adolescents, so health education is a central concern for those interested in adolescent health outcomes (Goesling et al. 2014; Jaramillo et al. 2017; Kirby 2001; Kohler et al. 2008; Lindberg and Maddow-Zimet 2012).

School is a critical source of education about sexuality. One analysis found that 22% of females and 30% of males did not talk to their parents about any sexual health topic before the age of 18 (Lindberg et al. 2016). The percentage of districts reporting policies requiring high schools to teach human sexuality has not changed significantly since 2000 (Centers for Disease Control and Prevention 2016:69). It is not clear why there are differences in education reported by students but not in district policy, though one study interviewing sex education teachers demonstrated that they often aim to provide students with more information even when school or district policy is restrictive (Preston 2019).

Political controversy

The social and political context in which sex education occurs affects the type of sex education that adolescents receive and the type of research conducted (Kendall 2013). The vast majority of the discourse and research surrounding sex education in the U.S. is characterized by the dichotomy of comprehensive versus abstinence-only approaches (Kendall 2013; Luker 2007; McKay 1998). In general, supporters of comprehensive sex education advocate for teaching students about contraception, STDs, and safe-sex practices. These programs may also address topics such as consent, sexual orientation, decision making, pleasure, and relationship skills. Lamb and Randazzo (2016:148) define two separate categories of comprehensive sex education: programs which are purely based on evidence of effectiveness at reducing teenage pregnancy and rates of STDs, and programs that teach "the social aspects of sex and sex education," such as sexual orientation and consent. Comprehensive sex education is often discussed as a matter of public health, though some suggest it could be a form of civics education or education about social inequality (Connell and Elliott 2009; Kendall 2013; Lamb and Randazzo 2016; McKay 1998).

On the other side of debates about sex education are proponents of abstinence-only education, who advocate that students be taught the importance of abstaining from sex until marriage. They argue that providing adolescents with information about sex will have the undesired consequence of encouraging them to become sexually active (Luker 2007). These arguments are often based in religious or moral beliefs, or in the claim that matters of sexuality are better left to families than schools. Abstinence-only programs are widely criticized by public health experts for their lack of efficacy in delaying first sex or in encouraging safe sex practices

among adolescents (Goesling et al. 2014; Kirby 2001; Kohler et al. 2008; Lindberg and Maddow-Zimet 2012). They are criticized by theorists and ethnographers for not giving adolescents agency or acknowledging that sexuality can be safe or even positive for adolescents (Fields 2008; Fine 1988; Fine and McClelland 2006; Levine 2003).

McKay (1998) describes the two main approaches to sex education in the U.S. as *Permissive* and *Restrictive* sexual ideologies. These approaches are associated with, but not analogous to, the major political divide in the United States, with comprehensive sex education supporters tending to be liberals, and abstinence-only sex education supporters tending to be conservatives (Kendall 2013). Luker (2007) found in her ethnographic research that the biggest difference between these the attitudes about sex among these two groups was that the restrictive group viewed sex as sacred, while the permissive group viewed sex as natural.

Although these two groups are often seens as mutually exclusive and dichotomous, even comprehensive sex education programs frequently teach about abstinence until marriage, and sometimes that it is the preferred option or the only acceptable option for adolescents. Kendall (2013) explains that there is a wide spectrum of "abstinence-based" and "abstinence-plus" programs, which encourage adolescents to abstain from sex, while also teaching about safe sex practices. Some programs may teach about safe sex practices such as birth control and condoms, but only to emphasize their ineffectiveness (Kendall 2013). Because of political pressure, almost all advocates of sex education also advocate teaching abstinence, and often advocate emphasizing abstinence as the best option (Levine 2003). Despite this political insistence on abstinence education, there are adolescents who report receiving instruction on methods of birth control but not how to say no to sex. These adolescents have been excluded from several recent

studies about behavioral outcomes from sex education (Kohler et al. 2008; Lindberg and Maddow-Zimet 2012).

Federal and state governments promote sex education, and often promote abstinence education programs in particular. In the U.S., 37 states require that abstinence be taught as part of school-based sex education (Santelli et al. 2017). Since the 1980s, the federal government has funded abstinence-only education programs. The federal definition of abstinence education specifies that the programs must teach that sexual activity should only occur in the context of marriage, and that "sexual activity outside of marriage is likely to have harmful psychological and physical effects" (Santelli et al. 2017:274). The federal government allocated 85 million dollars to abstinence-only programs for the 2016 fiscal year, and 176 million dollars to comprehensive programs. The most rapid increases in funding for abstinence-only programs occurred between 1996 and 2006 (Santelli et al. 2017). This may be part of the reason why the percentage of adolescents who reported receiving comprehensive sex education declined significantly between 1995 and 2011–13 (Lindberg et al. 2016, 2006).

Public health officials and youth advocates are critical of the content of both abstinence-only and comprehensive sex education programs. Reports indicate that many of the abstinence-only programs funded by federal grants contain false information, gender stereotypes, moral judgements, and religious concepts (Santelli et al. 2017; Waxman 2004). Many scholars criticize both comprehensive and abstinence-only programs for basing their lessons in fear, denying young people sexual agency, and treating sex "as a dangerous and corrupting influence for children" (Connell and Elliott 2009:86; Fields 2008; Fine and McClelland 2006; Levine 2003). Programs typically do not socially situate what adolescents learn by discussing

relationships or inequality, instead focusing largely on biology and anatomy (Carter 2007; Fields 2008; Sears 1992). Programs also may not be culturally relevant to racial minorities and immigrants, and may not provide relevant information to LGBTQ students (Elia and Eliason 2010; García 2009; Geronimus 2003; Sears 1992).

Estimates from recent years indicate that many adolescents are not receiving comprehensive sex education. According to estimates from 2011–13, only 53% of female 15–19 years olds and 38% of male 15–19 years olds reported learning from formal sources about where to obtain birth control (Lindberg et al. 2016). Only 50% of females and 58% of males reported being taught how to use a condom (Lindberg et al. 2016). 28% of females and 35% of males reported learning how to say no to sex without learning about methods of birth control (Lindberg et al. 2016). According to the 2016 School Health Policies and Practices study, 81.6% of districts in the U.S. had a policy that high schools will teach STD prevention, and 76.3% required high schools to teach pregnancy prevention (Centers for Disease Control and Prevention 2016).

Rates of receipt of sex education are associated with a variety of factors, including demographic characteristics. Researchers have found associations between whether adolescents report receiving sex education and characteristics such as gender, race, socioeconomic status, and geographic region (Kohler et al. 2008; Landry et al. 2003; Landry, Kaeser, and Richards 1999; Lindberg et al. 2016, 2006). There is inequality not only in who receives sex education at all, but also in what type of sex education they receive. These differences are important because access to sexual health information is a critical aspect of adolescent and adult health. Unequal access to these programs precipitates inequality in health and can perpetuate social inequality

and different health outcomes by demographic. It is especially important for those who have limited access to healthcare to receive accurate health information.

Regional differences

Studies have shown significant regional differences in content of sex education in the United States (Landry et al. 2003, 1999). A 1999 survey of teachers found that those in the Southern and Midwestern regions of the U.S. were significantly more likely than teachers in the Northeast to report teaching abstinence as the only option outside of marriage, and less likely to teach how to use a condom, even when controlling for other contextual factors such as size of school and concern about community reaction to sex education (Landry et al. 2003). Similarly, a 1998 survey of school district policy found that among districts which have a policy that sexuality education be taught, districts in the South were significantly more likely to have policies requiring abstinence-only education, even after controlling for size of school and metropolitan status (Landry et al. 1999). The same survey found that districts in the Northeast were most likely to have a policy that sexuality education be taught, whereas schools in the Midwest were most likely to leave the decision to individual schools or teachers (Landry et al. 1999). This difference by region held when controlling for size and metropolitan status of district.

The 1998 survey of school district policy also compared sex education policy by district size, and found that large and medium sized districts were more likely to require that sex education be taught than small school districts (Landry et al. 1999). They found that the association between district size and probability of requiring that sex education be taught holds

even when controlling for region and metropolitan status. Although most U.S. school districts are small, students are disproportionately likely to go to large school districts, so the authors estimate that 86% of students attend school districts which require that sexuality education be taught. The 1999 survey of teachers found that teachers at the largest schools and at schools with the highest rates of students in poverty were less likely than those with the lowest rates of students in poverty to teach abstinence-only education, even when controlling for contextual factors such as region and concern about community reaction (Landry et al. 2003).

Metropolitan status is also associated with sex education policy and practice. An analysis of 2011–2013 National Survey of Family Growth data found that those in rural areas were significantly less likely than those in cities to learn how to use a condom and where to get birth control (Lindberg et al. 2016). Another study found that among heterosexual, never-married adolescents, those who had never received sex education were significantly more likely to live in a rural area (Kohler et al. 2008). According to a 1998 survey of school districts, suburban school districts were significantly more likely than average to have a policy requiring that sexuality education be taught, and districts in nonmetropolitan counties were significantly less likely than average to have such a policy (Landry et al. 1999). However, the relationship between metropolitan status and policy did not hold when accounting for region and district size.

Gender

Several studies have found higher rates of sex education among females. One study found that 15–17 year old females were significantly more likely to report having received formal sex education about birth control, STDs, and how to say no to sex than males (Lindberg et al. 2000).

A study in sex education trends between 2006–10 and 2011–13 found significant declines in formal sex education for females, which they describe as "a consequence of a shift away from formal instruction for girls, bringing them in line with the more limited instruction received by teen boys" (Lindberg et al. 2016:624–25).

An earlier study found that the largest difference by gender in receipt of sex education was on the topic of how to say no to sex, for which 92.9% of females reported having received education, compared to 74.9% of males (Lindberg et al. 2000). The authors of the study acknowledged that the wording of the question about how to say no to sex was different on versions of surveys given to female and male respondents, which could have been part of the reason for the difference. They also found that sexually experienced females were significantly more likely than sexually experienced males to report receiving instruction on each of the topics before first intercourse (Lindberg et al. 2000). They suggested that this is due to earlier sexual debut among males than among females, though they did not examine median age at first instruction among females (Lindberg et al. 2000). Another study found that among heterosexually experienced respondents, females were significantly more likely to have learned about birth control from formal sources than males (Donaldson et al. 2013).

The qualitative experiences of women in sex education often reveal more patterns of inequality. Criticisms of sex education point out how the programs often only explore women as passive (Fields 2008; Fine 1988; Fine and McClelland 2006). Interviews with young Latina women about school-based sex education found that teachers often reinforced the idea of women as sexual gatekeepers through their language and demeanor, even when the content of sex education was ostensibly equitable (García 2009). Through in-classroom observations, Kendall

(2013) and Fields (2008) found that teachers sometimes reinforced gender stereotypes through their language and behavior.

Sexual orientation

Some research specifically excludes non-straight students when looking at sex education as a potential causal pathway for behavioral outcomes because school-based sex education programs typically do not teach about queer sexualities (Donaldson et al. 2013; Jaramillo et al. 2017; Kohler et al. 2008). This is a serious limitation of research, since non-straight adolescents are still at risk, and sometimes even higher risk, for negative health outcomes and pregnancy (Bodnar and Tornello 2019; Saewyc et al. 1999). Some studies have found that gay and bisexual men are less likely to receive HIV/AIDS education, despite higher levels of sexual risk behavior (Blake et al. 2001; Goodenow, Netherland, and Szalacha 2002). Qualitative research indicates major gaps in information provided to LGBTQ youth in sex education. Numerous interviews with LGBTQ youth found that they received almost no relevant sexual health information in their school-based sex education programs (Fisher 2009; Hillier and Mitchell 2008; Pingel et al. 2013). Interviews with Latina women found that they were even sometimes chastised by teachers for asking about same-sex sexuality (García 2009).

Socioeconomic status

Socioeconomic status is another demographic trait associated with access to sex education. Most analyses of data from the National Survey of Family Growth have found that wealthier adolescents are more likely to receive sex education. A study of National Survey of

Family Growth data from 2006–2016 found that wealthier respondents, both males and females, were significantly more likely to report learning how to say no to sex (Lindberg et al. 2016). Wealthier males were significantly more likely than poorer males to report learning about HIV/AIDS (Lindberg et al. 2016). An analysis of National Survey of Family Growth data found that those who had never received sex education were significantly more likely to be in the lowest income quartile and to come from a nonintact family unit (Kohler et al. 2008). Those receiving abstinence-only sex education were somewhat more likely to be from low-to-moderate income households (Kohler et al. 2008).

In contrast to the findings that wealthier students were more likely to receive sex education, a survey of teachers found that those teaching at schools with higher rates of poverty were more likely to teach specific skills such as how to use a condom and how to access birth control and STD treatment services, and less likely to teach abstinence-only sex education (Landry et al. 2003). They found that teachers in schools with 6–30% of the student body living in poverty were significantly more likely to teach those specific skills than teachers at schools where less than 6% of the student body lived in poverty, even when controlling for region, size of school, and concern about community reaction, district sex education policy, and instructor's specialty (Landry et al. 2003). When compared to teachers at schools with the lowest rates of poverty (less than 6% of the student body), teachers at schools with the highest levels of poverty (more than 30% of the student body) were significantly less likely to report not teaching methods of birth control or emphasizing the ineffectiveness of birth control. This effect was found after controlling for contextual factors such as region, size of school, and concern about community reaction (Landry et al. 2003).

Race

Race is another demographic factor associated with access to sex education. One analysis of the National Survey of Family Growth found that in 2011–13, for respondents ages 15–19, Hispanic respondents were significantly less likely than white respondents to have learned about waiting until marriage to have sex (Lindberg et al. 2016). They found that from 2006–2013 among males, white respondents were significantly more likely to report learning how to say no to sex than Hispanic or black respondents. Among both females and males ages 15–19 in 2011–2013, Hispanic respondents were significantly more likely than white respondents to report learning how to use a condom. Among females, black and Hispanic respondents were more likely to report learning how to use a condom than whites. Black females were significantly more likely than white females to report learning about methods of birth control in 2011–13 (Lindberg et al. 2016). A different study which considered respondents ages 15–24 instead of only 15–19 did not replicate this finding (Vanderberg et al. 2016). An analysis of the 2002 National Survey of Family Growth did not find any significant differences by race in type of sex education that adolescents reported receiving (Kohler et al. 2008). A study of 1995 data found that black males were significantly more likely than either white or Hispanic males to report having been taught how to use a condom (Lindberg et al. 2000).

There are also differences by race in timing of instruction relative to first sex. Lindberg et al. (2000) reported that 70.4% of sexually experienced males had received instruction on at least one topic before first intercourse. Among sexually experienced male respondents, black males were least likely to have learned any of the skills asked about before first intercourse, with slightly higher proportions among Hispanic males, and highest among white males. They suggest

that this is due to lower age at first intercourse among black males, since they did not find

significant differences in median age at first instruction by race (Lindberg et al. 2000).

In addition to the racial differences in access to sex education, teachers and

administrators convey racial bias to students in sex education classes in subtle ways. One

ethnographic article documented the behaviors of educators that show racialized assumptions

about teenage sexuality (García 2009). Latina students recalled how their teachers referred to a

category of sexually promiscuous and consequently morally reprehensible women. The teachers

implied that the women in this category were Latina through references to neighborhoods and

social circles (p. 530). Latina students also recalled how their teachers warned them of the sexual

aggression and machismo of Latino men, and how the students must resist men's manipulation

(p. 531). Many researchers criticize formal sex education for not allowing for cultural diversity

or nondominant perspectives on sexuality (Geronimus 2003; Sears 1992; Zimmerman 2015).

Immigration status

A study of the 2013–2015 National Survey of Family Growth which considered Hispanic

women ages 18–24 who had never been pregnant and were not currently married found that

foreign-born respondents were significantly less likely than US-born respondents to report

formal STD education. However, this difference disappeared when controlling for other

demographic factors. In fact, there were no significant differences in *each specific topic* (how to

say no to sex, birth control, STDs, HIVs) of formal sex education by nativity status after

controlling for other demographic factors (Espinoza 2019). Foreign-born respondents were

significantly less likely to report *any* type of formal sex education even after controlling for other

factors, as well as significantly less likely to report having talked to their parents about HIV (Espinoza 2019).

Religious differences

Lindberg et al. (2016) found that among both male and female respondents (ages 15–19) in 2011–2013, those reporting some or no religious attendance at age 14 were significantly less likely to report learning about abstinence until marriage than those reporting frequent religious attendance (Lindberg et al. 2016). Males who never attended religious services at age 14 were significantly more likely to report learning about methods of birth control than those who attended religious services often. This analysis used questions that asked about any formal sex education, including in churches, so religious differences are not surprising (Lindberg et al. 2016).

Summary of previous research

Research about sex education has relied upon questions about birth control and about how to say no to sex as the main indicators of type of sex education received. Additionally, research has been unable to distinguish whether instruction from formal sources occurs in schools or in other places. The most recent estimates of access to sex education do not use multiple regression to control for variables when predicting sex education receipt, nor do they consider school completion status or timing of instruction relative to first sex (Lindberg et al. 2016). Other recent research into access about sex education focuses primarily on behavior, and

excludes respondents whose sexual behavior does not conform to certain expectations such as delayed marriage and heterosexuality.

This analysis asks *which demographic groups are receiving sex education?* And, *which demographic groups are receiving sex education before they become sexually active?* I include measures of where instruction was received, and use multiple regression models to understand how which demographic characteristics are the best predictors of receipt of sex education in each topic.

Messages about abstinence

Another problem with previous research is that respondents who learned "how to say no to sex" were classified as recipients of abstinence education. With the new question introduced in the 2011 National Survey of Family Growth, there is now also a measure of whether a respondent learned about "waiting until marriage to have sex." The most recent analysis of this data found that in 2011–2013, 82% of females and 84% of males learned how to say no to sex, while 76% of females and 73% of males learned about waiting until marriage (Lindberg et al. 2016). I argue that adolescents who receive instruction about these topics are distinct groups, and that they are receiving different messages about sex.

The differences between the moral messages of how to say no to sex and of abstinence until marriage are numerous. Learning how to say no to sex does not necessarily carry the religious connotations of abstinence until marriage. Progressive sex education which teaches about social and relational aspects of sexuality, such as consent and bodily autonomy, may include lessons about how to say no to sex. Some parents may not expect adolescents to wait

until marriage to become sexually active, but still wish for them to delay becoming sexually active until they are older. This is especially true among wealthier, white communities, who generally expect their children to delay marriage and childbearing (Axinn and Thornton 1992; Geronimus 2003; South 2001). Even parents and advocates who do not wish or expect for adolescents to delay sexual activity may wish to teach them how to say no to sex as a matter of consent and agency. Ethnographic and theoretical research indicates that sex education does not typically allow for adolescent agency (Fields 2008; Fine 1988; Fine and McClelland 2006). Adolescents who learn how to say no to sex may be receiving messages that make them feel more in control of their sexuality than those who only learn about waiting until marriage.

We may infer that those who learn how to say no to sex without learning about abstinence until marriage are receiving more progressive messages about sexuality that give adolescents agency without necessarily containing religious messages. Those who learn neither how to say no nor abstinence could still be learning about skills and other topics, or they may not be receiving any sex education. Those who learn about abstinence but not how to say no are probably receiving a moral message which does not give any agency to teens deciding whether or not to have sex. Receiving education in both topics implies the moral issue of waiting until marriage is presented, but also allows adolescents to feel that not having sex is their choice.

This assessment has some limitations. Teaching adolescents to say no to sex gives them some agency, but still does not necessarily posit them as sexual agents capable of desire. Receiving education about abstinence until marriage may not imply receiving the prescriptive message that abstinence is the only acceptable option. These measures are imperfect representations of the many lessons young people receive about sexuality. Nonetheless, this

21

distinction allows for a more thorough quantitative analysis than has been possible before. My analysis aims to distinguish between the demographic groups who receive formal education in how to say no to sex, abstinence until marriage, both, or neither. I ask *which demographic groups receive formal messages about waiting until marriage to have sex and which receive formal messages about how to say no to sex?*

Data

The data for this study comes from the National Survey of Family Growth, a nationally representative survey of the household population ages 15–49 in the United States. The survey collects data about fertility, family planning, and reproductive health. It is conducted by the Centers for Disease Control and Prevention and data are released publicly for use by researchers. The National Survey of Family Growth has been conducted in some form since 1973. It uses a multi-stage probability sample design, which allows for more precise estimation of population parameters and lower survey cost. Data collection consists of in-person interviews using computer-assisted personal interviewing procedures. The survey has used continuous interviewing since 2006, meaning data are collected every year and released in bundles periodically.

This analysis uses the most recently available data from the 2015–2017 interviews, and only considers respondents asked about sex education topics. Respondents ages 15–24 (n = 3,205) were asked about their receipt of education about various sexuality topics from formal sources before age 18. I estimate the overall proportion of people in the United States who receive sex education before age 18. Because respondents aged 15–17 may report not having

received sex education at the time of the interview, but still may receive it before they turn 18, I exclude them from analysis. After excluding 15–17 year olds, the sample size was 2,130.

Methods

I conducted data analysis procedures with R, using the "survey" package to account for the complex survey design. Using the National Survey of Family Growth data, I estimated proportions of U.S. adolescents who received sex education overall and within each demographic subgroup.

I fit univariate and multivariable logistic regression models using demographic characteristics as explanatory variables, and sex education receipt reported as response variables. The logistic regression models provide estimates of the change in the logarithm of the odds ratio (log odds) of an outcome for each demographic group compared to a reference group. The outcome of interest is receipt of education in a topic. These models allow me to draw conclusions about what demographic traits are most closely associated with reported receipt of education about each topic. I am primarily interested in the direction of this change and whether it is statistically significant ($p < .05$ for a two-tailed hypothesis test). Multiple regression models provide estimates of the change in log odds for members a certain group while controlling for the other predictors. Since many of my explanatory variables are highly correlated with one another, multiple regression helps identify which categories are the most important in predicting receipt of education in a topic.

Next, I use linear regression to model the average age at first sexual experience and age at first instruction of each topic using demographic categories as predictors. I also use logistic

regression to model the change in log odds of reporting learning about a topic before first sexual experience. This allows me to determine the odds that a respondent in a subgroup reported learning about a topic before first sex compared to a reference group. I run these models with and without controlling for age at first sex in order to make inferences about whether sex education is occurring in a timely manner for each population subgroup, and whether any inequalities of timing relative to first sex are due to different age at first sex, different age at first instruction, or different reporting tendency.

In addition to estimating the proportions of adolescents receiving education in each topic and the odds ratios of receiving education in a topic relative to a reference group, I use multinomial logistic regression to analyze the differences between recipients of education about how to say no to sex, education about abstinence only, both, or neither. The multinomial regression model provides estimates for the log odds of being in each instruction receipt category according to the demographic variables of interest. I treat learning neither topic as the reference group, and estimate the log odds of being in each of the other three instruction receipt categories for each demographic subgroup.

Measures

Response variables

In the National Survey of Family Growth, respondents were asked whether they had received "any formal instruction at school, church, a community center or some other place" before the age of 18 about each of the following topics: how to say no to sex, methods of birth control, where to obtain birth control, how to use a condom, STDs, and waiting until marriage to

have sex (abstinence). If respondents reported receiving education from formal sources in a given topic, they were then asked at what age they first received that instruction. If they reported ever having intercourse, they were also asked whether instruction on each topic was before or after the first time they had sex. The question does not define what constitutes sex, so respondents might interpret that differently. For methods of birth control and abstinence until marriage, respondents were also asked the specific location of instruction. They were given the options school, church, a community center, and some other place.

In order to perform logistic regression calculations, I coded binary response variables indicating instruction on specific sexual health topics and abstinence topics (Table 1). The specific sexual health topic variables indicated whether the respondent had received education from formal sources about methods of birth control, where to obtain birth control, how to use a condom, and STDs. A fifth variable indicated whether respondents had learned about methods of birth control in schools, meaning that they learned birth control and named school as a place of instruction about birth control. If respondents reported learning about birth control in school in addition to other places, I coded that they learned birth control in school. The response variables for abstinence topics are whether respondents were taught how to say no to sex and whether they were taught about waiting until marriage to have sex (abstinence). I also coded a variable indicating if they were taught about waiting until marriage but not where to obtain birth control or how to use a condom, which I consider abstinence only, and whether they were taught about abstinence until marriage and named school as a place of that instruction (abstinence in schools). Similarly to birth control, respondents who reported learning abstinence in schools in addition to other places were coded positively for receiving abstinence education in schools.

I created the age at first instruction variable by adding five to grade at first instruction. Age at first sex is a variable provided by the National Survey of Family Growth. It is reported age at first sexual intercourse for females, and respondent date at first intercourse minus respondent date of birth for males.

Explanatory variables

In order to determine which demographic traits are associated with receipt of sex education, I use categorical variables. The National Survey of Family Growth provides data about respondents' gender, race, religion in which a respondent was raised, metropolitan status (as defined by U.S. Census Bureau), income level, living situation at age 14 (with both biological or adoptive parents from birth, with mother and stepfather, or other), whether born outside of the U.S., and mother's education level. I also created a variable for school completion status, which indicates whether the respondent dropped out. I coded respondents who were not currently in school and who did not have a high school diploma or GED as having dropped out.

I created an income quartile variable using respondent's household's percentage of poverty level. Each respondent's poverty level percentage was calculated using total household income adjusted for family size, and defined as a percentage of the poverty level set by the U.S. Census Bureau. I divided the sample into quartiles, and created a categorical variable. The groups were 0–93 percent of the poverty level, 94–189 percent of the poverty level, 190–359, and 360 percent or greater of the poverty level. I refer to the poorest quartile as the "1st income quartile" and the wealthiest quartile as the "4th income quartile." For the multinomial regression

Table 1: Response variables

Response variable	Question	Response indicated by binary variable
Birth control	Before you were 18, did you ever have any formal instruction at school, church, a community center or some other place about methods of birth control?	Yes
Birth control in school	Looking at Card 23a, where did you receive that instruction about methods of birth control? (Card 23a gives the following options: school, church, a community center, some other place)	Received birth control instruction and named school as at least one place of birth control instruction
Where to obtain birth control	Before you were 18, did you ever have any formal instruction at school, church, a community center or some other place about where to get birth control?	Yes
How to use a condom	Before you were 18, did you ever have any formal instruction at school, church, a community center or some other place about how to use a condom?	Yes
STDs	Before you were 18, did you ever have any formal instruction at school, church, a community center or some other place about sexually transmitted diseases?	Yes
How to say no to sex	Before you were 18, did you ever have any formal instruction at school, church, a community center or some other place about how to say no to sex?	Yes
Abstinence (waiting until marriage)	Before you were 18, did you ever have any formal instruction at school, church, a community center or some other place about waiting until marriage to have sex?	Yes
Abstinence in schools	Looking at Card 23a, where did you receive that instruction about waiting until marriage to have sex? (Card 23a gives the following options: school, church, a community center, some other place)	Received abstinence instruction and named school as at least only place of abstinence instruction
Abstinence only		Received instruction about abstinence but not about how to use a condom or where to obtain birth control
Age at first sex	For female respondents: (after question about date of first intercourse) That very first time that you had sexual intercourse with a man, how old were you? For male respondents: date at first intercourse minus date of birth	Numeric variable
Age at first instruction (for each topic)	What grade were you in when you first received instruction on [topic]?	Numeric variable made by adding five to grade
Instruction before first sex (for each topic)	Did you receive instruction about [topic] before or after the first time you had sex?	Before

Table 2: Sample Characteristics

Category	Proportion
Gender	
Male	.505
Female	.495
Race	
White	.517
Hispanic	.240
Black	.142
Other/Multiple Race	.101
Income	
1st income quartile	.261
2nd income quartile	.232
3rd income quartile	.260
4th income quartile	.247
Religion Raised	
Catholic	.292
Protestant	.505
Other religion	.094
No religion	.109
Metropolitan status	
Urban	.357
Suburban	.493
Rural	.150
Living situation at age 14	
Both parents	.639
Mother and stepfather	.102
Other living situation	.260
Nativity status	
Born in US	.874
Born outside US	.126
Mother's education	
Less than high school	.163
High school	.271
Some college	.253
Bachelor's degree or higher	.313
School completion status	
Finished or currently in school	.893
Dropped out	.107

section, I treat the percent of the poverty level percentage as a numeric variable. Those that have

family-size adjusted household incomes 500% of the poverty level or greater are bottom-coded

to 500, since the exact percentage value is not given to maintain privacy (U.S. Department of

Health and Human Services 2018).

The sex variable is a binary variable indicating female. In my analyses, I treat white as the reference group for race. Catholic is the reference group for religion raised. The poorest quartile is the reference group for income. Living with both biological or adoptive parents from birth is the reference group for living situation. Urban is the reference group for metropolitan status. Born in the U.S. is the reference group for nativity status. Mother did not complete high school is the reference group for maternal education. Currently in school or has a diploma or GED is the reference group for school completion status. The weighted sample proportions are in Table 2.

In the following section, I present the results of my analyses and contextualize them with past findings and theoretical understandings of sex education. When reporting results, I use 95% confidence intervals, and the term "significant" means p < .05 unless otherwise noted.

Results and Discussion

Overall rates of sex education

Table 3 shows the proportion of respondents in each demographic subgroup who received education in each safe sex topic, with 95% confidence intervals. Among 18–24 year olds, 69.6%, CI: [.658, .732], reported learning about methods of birth control from formal sources before age 18. Among those who learned birth control from formal sources, 94.4%, CI: [.921, .96], reported learning about birth control in schools. Of the entire sample, 65.7%, CI: [.619, .693], reported learning about methods of birth control in schools. Significantly fewer, 52.2%, CI: [.482, .562], reported learning about where to obtain birth control. 64.6%, CI: [.602, .688], reported learning how to use a condom. 91.1%, CI: [.888, .929], reported learning about STDs, which is significantly more than reported learning about any other topic I considered.

Table 4 shows the proportion of respondents in each demographic group who learned about abstinence topics. The majority of respondents received instruction about abstinence and how to say no to sex. 77.8%, CI: [.75, .804], reported learning how to say no to sex from formal sources before the age of 18. 64.2%, CI: [.593, .688], reported learning about abstinence until marriage from formal sources before age 18. Of those who reported learning about abstinence until marriage, 53.3%, CI: [.482, .58], reported learning it in schools. Of the entire sample, 34.1%, CI: [.314, .368], reported learning about abstinence until marriage in schools. 15.5%, CI: [.123, .193], reported learning abstinence only, which I defined as learning about waiting until marriage but not about how to use a condom or where to obtain birth control. 13.4%, CI: [.104, .172], reported learning how to use a condom and where to obtain birth control, but not abstinence until marriage.

These estimates for the proportions of adolescents receiving formal instruction are within about 10 percentage points of the recent estimates for 18–19 year olds from Lindberg et al. (2016) in most topics. The exception is for learning about abstinence among males. Lindberg et al. (2016) found that 76% of 18–19 year old males in 2011–2013 learned about abstinence until marriage. I found that only 60% of 18–24 year old males in 2015–2017 reported learning about abstinence until marriage. Since Lindberg et al. (2016) considered 18–19 year olds interviewed in the years 2006–2013, and I considered 18–24 year olds interviewed in the years 2015–2017, there is overlap in the age cohorts of respondents. Therefore, these numbers should not be treated as trends.

My analysis shows that a substantial number of adolescents in the United States do not receive formal instruction on safe-sex topics before the age of 18. More than 90% of adolescents report learning about STDs, but only a little over half reported learning where to obtain birth control, and only two thirds reported learning how to use a condom. Since research widely shows that abstinence-only sex education does not reduce sexual risk behaviors, teaching about specific sexual health skills is necessary to improve adolescent health outcomes (Kirby 2001; Kohler et al. 2008; Lindberg and Maddow-Zimet 2012).

The high prevalence of education about STDs without education about safe sex practices supports other researchers' claims that formal sex education focuses mostly on negative outcomes such as disease (Fields 2008; Fine 1988; Kendall 2013). Sociologists criticize this fear-based sex education because it does not discuss desire, pleasure, or possibilities for safe sex, and therefore does not allow adolescents to be sexual subjects (Fields 2008; Fine 1988; Fine and McClelland 2006; Kendall 2013; Levine 2003).

Table 3: Proportion of respondents who reported receiving education about safe sex topics, with confidence intervals

	Methods of birth control	Birth control in school	Where to get birth control	How to use a condom	STDs
Total	.696 (.658, .732)	.657 (.619, .693)	.522 (.482, .562)	.646 (.602, .688)	.911 (.888, .929)
Gender					
Male	.681 (.635, .724)	.665 (.619, .708)	.507 (.458, .556)	.683 (.632, .73)	.92 (.889, .943)
Female	.712 (.657, .761)	.649 (.595, .699)	.538 (.484, .59)	.609 (.552, .664)	.901 (.861, .93)
Race					
White	.714 (.654, .768)	.688 (.627, .743)	.515 (.459, .57)	.616 (.562, .668)	.902 (.861, .932)
Hispanic	.695 (.645, .74)	.665 (.612, .714)	.542 (.477, .605)	.673 (.601, .738)	.913 (.866, .944)
Black	.655 (.597, .709)	.601 (.528, .67)	.549 (.482, .614)	.745 (.689, .794)	.936 (.904, .958)
Other/Multiple Race	.666 (.551, .764)	.56 (.456, .659)	.477 (.382, .573)	.599 (.483, .705)	.915 (.859, .95)
Income					
1st income quartile	.693 (.63, .749)	.632 (.56, .699)	.535 (.47, .598)	.644 (.569, .712)	.903 (.862, .932)
2nd income quartile	.643 (.552, .725)	.615 (.529, .694)	.478 (.389, .569)	.663 (.586, .732)	.887 (.828, .927)
3rd income quartile	.686 (.623, .742)	.649 (.588, .706)	.523 (.464, .581)	.622 (.544, .694)	.893 (.825, .936)
4th income quartile	.761 (.695, .817)	.731 (.663, .79)	.55 (.479, .62)	.66 (.594, .72)	.961 (.935, .977)
Religion Raised					
Catholic	.742 (.685, .792)	.718 (.662, .768)	.529 (.474, .583)	.69 (.617, .754)	.933 (.884, .962)
Protestant	.681 (.625, .732)	.628 (.571, .682)	.534 (.486, .58)	.642 (.589, .691)	.905 (.866, .933)
Other religion	.64 (.552, .72)	.621 (.536, .7)	.433 (.327, .545)	.526 (.35, .695)	.871 (.779, .928)
No religion	.708 (.607, .792)	.675 (.577, .76)	.546 (.47, .62)	.681 (.6, .752)	.908 (.848, .946)
Metropolitan status					
Urban	.72 (.673, .762)	.673 (.622, .72)	.574 (.523, .624)	.647 (.572, .716)	.918 (.883, .943)
Suburban	.695 (.634, .75)	.67 (.609, .726)	.491 (.432, .55)	.643 (.59, .693)	.911 (.874, .938)
Rural	.645 (.501, .766)	.577 (.429, .712)	.503 (.38, .626)	.656 (.55, .748)	.891 (.793, .946)
Living situation at age 14					
Both parents	.697 (.65, .739)	.663 (.617, .706)	.521 (.477, .564)	.643 (.59, .693)	.9 (.869, .925)
Mother and stepfather	.675 (.55, .779)	.643 (.52, .75)	.473 (.365, .583)	.625 (.511, .727)	.928 (.822, .973)
Other living situation	.704 (.647, .755)	.648 (.589, .702)	.546 (.493, .598)	.664 (.591, .73)	.929 (.902, .949)
Nativity status					
Born in US	.653 (.567, .73)	.642 (.559, .717)	.523 (.413, .631)	.668 (.571, .753)	.878 (.788, .933)
Born outside US	.702 (.659, .742)	.659 (.617, .699)	.523 (.484, .562)	.643 (.597, .687)	.916 (.889, .937)
Mother's education					
Less than high school	.676 (.597, .746)	.634 (.564, .699)	.517 (.42, .612)	.684 (.604, .754)	.875 (.799, .925)
High school	.721 (.669, .768)	.658 (.596, .716)	.596 (.544, .646)	.689 (.629, .743)	.938 (.912, .957)
Some college	.665 (.588, .734)	.641 (.566, .71)	.481 (.411, .552)	.646 (.568, .716)	.904 (.84, .945)
Bachelor's degree or higher	.71 (.639, .772)	.683 (.606, .752)	.495 (.433, .557)	.595 (.527, .659)	.911 (.862, .944)
School completion status					
Finished or currently in school	.718 (.675, .757)	.678 (.637, .716)	.535 (.492, .576)	.653 (.607, .696)	.921 (.899, .939)
Dropped out	.519 (.438, .599)	.483 (.404, .563)	.422 (.348, .499)	.594 (.49, .69)	.822 (.728, .888)

Notes: Confidence intervals calculated using *logit* method for confidence intervals of a proportion with "survey" package.

Table 4: Proportion of respondents who reported receiving education about abstinence topics, with confidence intervals

	How to say no to sex	Abstinence until marriage	Abstinence only	Abstinence in school
Total	.778 (.75, .804)	.642 (.593, .688)	.155 (.123, .193)	.341 (.314, .368)
Gender				
Male	.765 (.719, .805)	.6 (.543, .655)	.133 (.098, .179)	.323 (.288, .36)
Female	.792 (.753, .826)	.685 (.626, .739)	.176 (.137, .223)	.359 (.323, .396)
Race				
White	.764 (.723, .8)	.639 (.57, .702)	.194 (.156, .239)	.336 (.296, .378)
Hispanic	.794 (.735, .842)	.629 (.551, .701)	.12 (.071, .194)	.329 (.273, .389)
Black	.814 (.747, .866)	.657 (.588, .72)	.094 (.067, .13)	.358 (.308, .411)
Other/Multiple Race	.766 (.678, .836)	.67 (.577, .752)	.122 (.071, .201)	.37 (.277, .474)
Income				
1st income quartile	.748 (.698, .793)	.617 (.542, .687)	.129 (.093, .176)	.347 (.288, .411)
2nd income quartile	.752 (.676, .814)	.68 (.611, .742)	.171 (.113, .251)	.303 (.253, .358)
3rd income quartile	.765 (.701, .819)	.623 (.541, .697)	.162 (.108, .234)	.31 (.263, .362)
4th income quartile	.849 (.797, .889)	.653 (.585, .715)	.159 (.118, .212)	.401 (.352, .452)
Religion Raised				
Catholic	.766 (.706, .817)	.605 (.542, .666)	.116 (.077, .17)	.368 (.316, .424)
Protestant	.779 (.738, .815)	.692 (.627, .75)	.166 (.128, .212)	.327 (.283, .375)
Other religion	.819 (.747, .875)	.713 (.521, .851)	.284 (.154, .463)	.298 (.226, .381)
No religion	.793 (.728, .846)	.463 (.381, .546)	.094 (.064, .138)	.375 (.303, .454)
Metropolitan status				
Urban	.766 (.724, .804)	.657 (.591, .718)	.15 (.107, .207)	.346 (.306, .389)
Suburban	.795 (.753, .831)	.626 (.56, .688)	.146 (.108, .195)	.347 (.304, .393)
Rural	.753 (.669, .821)	.659 (.517, .777)	.192 (.119, .296)	.307 (.219, .411)
Living situation at age 14				
Both parents	.798 (.765, .828)	.664 (.61, .714)	.168 (.129, .214)	.354 (.32, .39)
Mother and stepfather	.778 (.671, .858)	.613 (.491, .722)	.18 (.107, .287)	.367 (.271, .474)
Other living situation	.729 (.675, .777)	.6 (.519, .676)	.113 (.078, .16)	.297 (.248, .351)
Nativity status				
Born in US	.763 (.662, .842)	.715 (.612, .799)	.167 (.095, .277)	.371 (.269, .486)
Born outside US	.78 (.753, .806)	.633 (.582, .68)	.153 (.122, .19)	.337 (.308, .367)
Mother's education				
Less than high school	.814 (.728, .878)	.632 (.554, .704)	.137 (.077, .229)	.351 (.276, .433)
High school	.761 (.702, .812)	.61 (.538, .678)	.094 (.066, .132)	.332 (.284, .384)
Some college	.809 (.768, .845)	.664 (.574, .743)	.163 (.111, .233)	.339 (.276, .407)
Bachelor's degree or higher	.752 (.696, .801)	.661 (.592, .724)	.207 (.158, .267)	.35 (.293, .411)
School completion status				
Finished or currently in school	.794 (.766, .819)	.651 (.596, .702)	.154 (.121, .195)	.351 (.322, .38)
Dropped out	.649 (.527, .754)	.572 (.486, .655)	.157 (.088, .266)	.259 (.191, .341)

Notes: Confidence intervals calculated using *logit* method for confidence intervals of a proportion with "survey" package.

Logistic regression predicting receipt of instruction by topic

In order to explore relationships between demographic traits and sex education received, I fit simple logistic regression models with one categorical explanatory variable and one binary response variable. The single logistic regression models indicate significant differences between receipt of sex education topics by gender, race, income level, religion, metropolitan status, living situation at age fourteen, mother's education level, and school completion status. No significant differences were found by nativity status.

Because many of the demographic traits of interest are highly correlated with one another, I fit multivariable logistic regression models to understand which traits serve as the best predictors of who will receive each sex education topic. Recent estimates of sex education receipt from the National Survey of Family Growth lack multivariable models (Lindbergh 2016).

Birth control

Table 5 shows the results of the single variable regression models predicting receipt of instruction about birth control topics. Table A.1 in the appendix shows results of the corresponding multiple regression models. According to both the single and multiple regression models, non-Christians were significantly more likely than Catholics to report learning about methods of birth control. When compared to those who completed or were currently in school, adolescents who dropped out were significantly less likely to learn about methods of birth control, birth control in school, or where to get birth control. This difference remained even when controlling for other demographic characteristics in the multiple regression models. Other/multiple race respondents were significantly less likely than white respondents to report

Table 5: Univariate logistic regression models predicting receipt of education about birth control

	Methods of birth control		Birth control in school		Where to get birth control	
	β	SE	β	SE	β	SE
Gender						
Female	.144	(.147)	−.072	(.140)	.121	(.127)
Constant (Male)	.760***	(.103)	.686***	(.100)	.029	(.098)
Race						
Hispanic	−.095	(.165)	−.105	(.171)	.108	(.131)
Black	−.276	(.187)	−.379	(.201)	.137	(.178)
Other	−.229	(.249)	−.549*	(.231)	−.153	(.208)
Constant (White)	.917***	(.141)	.790***	(.135)	.060	(.111)
Income						
2nd income quartile	−.224	(.214)	−.072	(.217)	−.225	(.178)
3rd income quartile	−.032	(.174)	.075	(.186)	−.047	(.179)
4th income quartile	.345	(.220)	.459*	(.222)	.063	(.180)
Constant	.813***	(.139)	.541***	(.149)	.139	(.128)
Religion raised						
Protestant	−.302	(.173)	−.410*	(.163)	.020	(.134)
Other religion	−.482*	(.216)	−.439*	(.206)	−.385	(.213)
No religion	−.172	(.282)	−.205	(.256)	.070	(.180)
Constant (Catholic)	1.058***	(.140)	.935***	(.131)	.115	(.109)
Metropolitan Status						
Suburban	−.118	(.172)	−.013	(.182)	−.335*	(.146)
Rural	−.346	(.284)	−.412	(.286)	−.285	(.251)
Constant (Urban)	.942***	(.109)	.722***	(.111)	.298**	(.103)
Living situation at age 14						
Mother and stepfather	−.102	(.269)	−.088	(.272)	−.191	(.219)
Other living situation	.035	(.158)	−.068	(.145)	.102	(.101)
Constant (Both parents)	.832***	(.106)	.677***	(.099)	.083	(.087)
Nativity status						
Born outside US	−.213	(.209)	−.062	(.192)	−.017	(.216)
Constant (Born in US)	.858***	(.100)	.658***	(.091)	.092	(.079)
Mother's Education						
Completed high school	.215	(.197)	.106	(.199)	.322	(.189)
Some college	−.049	(.222)	.031	(.208)	−.143	(.232)
Bachelor's degree or higher	.162	(.226)	.220	(.225)	−.087	(.223)
Constant (Less than high school)	.735***	(.170)	.550***	(.146)	.067	(.193)
School completion status						
Dropped out	−.858***	(.205)	−.812***	(.186)	−.454**	(.168)
Constant (Finished or currently in school)	.933***	(.102)	.745***	(.090)	.138	(.085)

Notes: $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

learning about birth control in schools. Protestants and non-Christians were less likely than Catholics to learn methods of birth control in schools, though this effect only remained significant for non-Christians in the multiple regression model. In the single regression model,

respondents in the highest income quartile were significantly more likely than those in the lowest

income quartile to learn about birth control in schools. In the multiple regression, this difference

is not significant.

Those in suburban areas were significantly less likely to learn where to obtain birth

control compared to those in cities. Other than being in a suburban area and having dropped out,

there were no significant predictors of having learned about where to obtain birth control.

Condoms

Table 6 shows the results of single logistic regression models predicting receipt of

instruction about condoms and STDs. Table A.2 in the appendix shows the results of the multiple

regression models. Female respondents were less likely to learn how to use a condom than male

respondents. This difference was significant in both the single and multiple regression models.

Those who dropped out were more likely to report learning how to use a condom, but only after

controlling for other factors. Condoms are an effective and readily-available method of

preventing pregnancy and STDs, so using condoms is an important skill for adolescents to learn.

Gender discrepancy in receipt of instruction about condom use is concerning. Because sexual

relations are dyadic and both partners should have agency in an experience, it is important that

young women have knowledge about safe sex practices like condom use (Fields 2008; Fine

1988; García 2009).

Even when controlling for other characteristics, black respondents were significantly

more likely to report learning how to use a condom than white respondents. The reason for this is

unclear. Some sex education may be targeted at black adolescents, which may indicate views of

Table 6: Univariate logistic regression models predicting
receipt of education about condoms and STDs

	How to use a condom		STDs	
	β	SE	β	SE
Gender				
Female	−.324*	(.136)	−.239	(.271)
Constant (Male)	.768***	(.113)	2.446***	(.181)
Race				
Hispanic	.248	(.155)	.126	(.294)
Black	.599***	(.163)	.458	(.303)
Other	−.074	(.245)	.152	(.362)
Constant (White)	.474***	(.112)	2.221***	(.199)
Income				
2nd income quartile	.083	(.179)	−.166	(.359)
3rd income quartile	−.094	(.207)	−.109	(.285)
4th income quartile	.070	(.218)	.973**	(.344)
Constant	.592***	(.156)	2.226***	(.197)
Religion raised				
Protestant	−.215	(.181)	−.380	(.374)
Other religion	−.695	(.363)	−.724	(.444)
No religion	−.042	(.263)	−.340	(.455)
Constant (Catholic)	.798***	(.160)	2.635***	(.301)
Metropolitan status				
Suburban	−.018	(.162)	−.083	(.283)
Rural	.038	(.252)	−.308	(.389)
Constant (Urban)	.607***	(.157)	2.414***	(.195)
Living situation at age 14				
Mother and stepfather	−.076	(.243)	.352	(.538)
Other living situation	.092	(.173)	.372	(.227)
Constant (Both parents)	.588***	(.112)	2.203***	(.157)
Nativity status				
Born outside US	.115	(.203)	−.475	(.379)
Constant (Born in US)	.589***	(.098)	2.393***	(.154)
Mother's education				
Completed high school	.024	(.191)	.772*	(.346)
Some college	−.170	(.192)	.301	(.389)
Bachelor's degree or higher	−.387	(.219)	.385	(.389)
Constant (Less than high school)	.771***	(.174)	1.947***	(.282)
School completion status				
Dropped out	−.251	(.214)	−.932**	(.291)
Constant (Finished or currently in school)	.631***	(.098)	2.462***	(.136)

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

black adolescents as hypersexualized. As Fields (2008) writes, public opinion about sex education often views white youth, especially young white women, as innocent and in danger of being corrupted, while no such concern is expressed for black adolescents. A more optimistic

interpretation of the relative likelihood of black adolescents to learn about condoms is that programs may be specifically targeted toward students with less access to health care or higher rates of STDs, who are disproportionately likely to be black (Centers for Disease Control and Prevention 2017; Richardson and Norris 2010).

STDs

Respondents in the highest income quartile were significantly more likely than those in the lowest income quartile to learn about STDs, even after controlling for other factors. Those whose mothers completed high school were significantly more likely to learn about STDs than those whose mothers did not, though this effect did not hold when controlling for other factors. Those who dropped out were significantly less likely to report learning about STDs, even after controlling for other factors.

How to say no

Table 7 shows the results of the single logistic regression models predicting receipt of instruction about how to say no to sex and other abstinence topics. Table A.3 in the appendix shows the multiple regression models. Respondents in the highest income quartile were significantly more likely than those in the lowest income quartile to learn about how to say no to sex. Those not living with two parents at age 14 and those who had dropped out were significantly less likely to learn how to say no to sex. Those whose mothers completed a bachelor's degree were significantly less likely to report learning how to say no to sex, but this is only statistically significant in the multiple regression model.

Table 7: Univariate logistic regression models predicting receipt of education about abstinence topics

	How to say no		Abstinence until marriage		Abstinence in school		Abstinence only	
	β	SE	β	SE	β	SE	β	SE
Gender								
Female	.158	(.168)	.371*	(.143)	.158	(.111)	.331	(.182)
Constant (Male)	1.179***	(.119)	.406**	(.117)	−.740***	(.083)	−1.873***	(.175)
Race								
Hispanic	.175	(.187)	−.040	(.211)	−.032	(.171)	−.572*	(.270)
Black	.305	(.227)	.080	(.165)	.099	(.124)	−.841***	(.211)
Other	.014	(.246)	.140	(.217)	.152	(.238)	−.550*	(.269)
Constant (White)	1.172***	(.107)	.569***	(.143)	−.682***	(.091)	−1.425***	(.133)
Income								
2nd income quartile	.017	(.218)	.277	(.196)	−.199	(.202)	.332	(.225)
3rd income quartile	.091	(.219)	.022	(.200)	−.165	(.190)	.265	(.219)
4th income quartile	.633**	(.219)	.153	(.201)	.233	(.168)	.248	(.239)
Constant	1.090***	(.126)	.479**	(.154)	−.633***	(.137)	−1.912***	(.184)
Religion raised								
Protestant	.071	(.192)	.381*	(.189)	−.181	(.167)	.417	(.284)
Other religion	.326	(.288)	.484	(.398)	−.318	(.223)	1.107**	(.361)
No religion	.157	(.213)	−.578**	(.193)	.030	(.202)	−.228	(.302)
Constant (Catholic)	1.186***	(.156)	.428**	(.129)	−.539***	(.116)	−2.032***	(.223)
Metropolitan status								
Suburban	.166	(.158)	−.135	(.160)	.003	(.151)	−.034	(.183)
Rural	−.075	(.209)	.006	(.298)	−.181	(.218)	.295	(.315)
Constant (Urban)	1.188***	(.111)	.651***	(.141)	−.635***	(.091)	−1.731***	(.191)
Living situation at age 14								
Mother and stepfather	−.120	(.290)	−.220	(.254)	.052	(.230)	.087	(.299)
Other living situation	−.387*	(.162)	−.275	(.178)	−.263	(.156)	−.460	(.232)
Constant (Both parents)	1.376***	(.098)	.681***	(.116)	−.599***	(.076)	−1.603***	(.151)
Nativity status								
Born outside US	−.094	(.244)	.345	(.217)	.136	(.250)	.091	(.298)
Constant (Born in US)	1.268***	(.078)	.543***	(.105)	−.678***	(.067)	−1.711***	(.132)
Mother's education								
Completed high school	−.320	(.277)	−.093	(.206)	−.082	(.201)	−.424	(.306)
Some college	−.032	(.257)	.139	(.238)	−.052	(.230)	.208	(.361)
Bachelor's degree or higher	−.367	(.284)	.128	(.184)	−.004	(.227)	.502	(.319)
Constant (Less than high school)	1.479***	(.245)	.541**	(.162)	−.617***	(.173)	−1.844***	(.315)
School completion status								
Dropped out	−.734**	(.268)	−.331	(.219)	−.434*	(.211)	.024	(.342)
Constant (Finished or currently in school)	1.348***	(.082)	.622***	(.117)	−.617***	(.064)	−1.702***	(.141)

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Compared to respondents in the lowest income quartile of adolescents, those in the highest income quartile were significantly more likely to report learning about STDs and about how to say no to sex. The disparity by income may exacerbate inequalities, since the wealthiest

adolescents are also the ones with the best access to health care and information from other sources (Newacheck et al. 2003). One potential explanation for this discrepancy is that the wealthiest respondents attend the best schools. Fields (2008) found in her ethnographic research that students at private schools received more comprehensive and nuanced sex education than those at public schools. Other scholars have suggested that low-income adolescents are the most negatively affected by poor sex education (Fine 1988; Fine and McClelland 2006). Other researchers have suggested that this may be in part because the most underfunded schools have the most incentive to accept federal funding to provide abstinence-only programs, which require adherence to a strictly limited set of messages about waiting until marriage to have sex. As a result, adolescents in the poorest communities may receive the most stigmatizing messages about sexuality from schools (Fine and McClelland 2006).

The relationship between income and receipt of education about STDs and how to say no to sex does not appear to be linear. In my analysis, the wealthiest quartile of respondents received the best sex education, but those in the middle quartiles did not receive significantly better sex education than those in the poorest quartile.

The most consistently significant factor associated with receipt of education in every topic except abstinence and abstinence only was whether a respondent dropped out. This finding supports the idea that school is an important formal source of sex education. It also emphasizes the need for better sex education outside of school, in addition to the need for better educational programs to support students completing high school. Young people who do not complete school are vulnerable to many negative health and social outcomes. Researchers like Fine (1988) point out that those with worse educational opportunities are more likely to become pregnant as

teenagers. A lack of sex education may compound and contribute to inequalities of health and economic outcomes for adolescents who drop out (Fine and McClelland 2006; Penman-Aguilar et al. 2013).

Abstinence

Female respondents were significantly more likely than male respondents to learn about abstinence until marriage. Protestants were significantly more likely than Catholics to learn about abstinence until marriage. Those with no religious affiliation were significantly less likely than Catholics to learn abstinence until marriage from formal sources. In the multiple regression model, those in the second quartile for poverty level were significantly more likely than those in the first quartile to learn about abstinence. Those who dropped out were significantly less likely to learn abstinence in schools in the single regression, but this does not hold at the .05 level in the multiple regression model (p = .0933).

In the single regression model, females were marginally more likely to learn abstinence only (p = .0746). In the multiple regression, this reached the .05 significance threshold. In the single regression, Hispanic, black, and other/multiple race respondents were significantly less likely than white respondents to report learning abstinence only than white respondents. After controlling for other demographic factors is the multiple regression, this difference is significant only for black respondents, and marginally significant for other/multiple race respondents (p = .0615). Non-Christians were significantly more likely to learn abstinence only than Catholics.

Other researchers have found higher rates of education about abstinence and saying no to sex among females (Lindberg et al. 2000, 2016). My analysis supports this, but the relationship

is not statistically significant for abstinence in schools (p = .158). It may be that messages directed toward female students about abstinence are more likely to come from places other than schools. Regardless, female respondents seem to learn more about rejecting advances and about waiting until marriage than about making choices to have sex or how to use protection. This is consistent with ethnographic research, which found that sex education typically portrayed women as victims of male sexual desire rather than agents with desire of their own (Fields 2008; Fine 1988; García 2009; Kendall 2013).

Place of instruction

Previously, researchers have assumed that most formal sex education that adolescents receive is from schools, but have been unable to study the specific source using data from the National Survey of Family Growth. Indeed, my findings confirm that the majority of adolescents who learn about birth control from formal sources name school as a place of instruction. In contrast, nearly half of those who learn about abstinence until marriage reported learning about it only from sources other than school. Schools therefore seem to be particularly important for teaching students about specific skills, while students receive messages about abstinence elsewhere.

Another interesting finding is that there were no significant predictors of having learned abstinence in schools, but that there were significant predictors of learning birth control in schools. Religion was a significant predictor of learning birth control topics in schools, which may suggest that schools are still influenced by communities. This may be related to the

prevalence of religiously-influenced private schools, or it may be because schools, whether public or private, are influenced by community norms and values.

Age at first instruction relative to first sex

Timing of instruction is a relevant issue to consider while assessing access to sex education. The fact that a respondent reports receiving sex education in a topic does not mean that the instruction was useful or timely. In my sample, the average age at first intercourse was 16.58. For those concerned about the health risks of sex, education before the age of 18 is not necessarily adequate. Other research has hypothesized that different average age at first sex is a reason why some groups are less likely to report receiving education in a given topic before first sex (Lindberg et al. 2000, 2016).

In order to identify potential demographic differences between timing of instruction relative to first sexual experience, I fit simple linear regression models to compare when respondents first had vaginal intercourse and when they first received education in each topic. I also fit logistic regression models to show whether sexually experienced respondents reported receiving instruction before or after first sex. I fit each model with the explanatory variable alone, and controlling for age at first sex. I also fit multiple regression models using all explanatory variables, with and without controlling for age at first sex. In my sample, 79.2% of respondents reported having had intercourse. The other 20.8% (n = 465) of respondents were excluded from the analyses in this section, and additional respondents were excluded from each model predicting age at first receipt if they did not receive instruction on that topic.

Table 8: Average age at first sex and first instruction in each topic

	Average age	Standard deviation	Proportion who learned before first sex (among those who learned the topic at all)
First sex	16.578	2.084	
First instruction about methods of birth control	13.118	1.844	.894 (.859, .922)
First instruction about where to obtain birth control	13.450	1.767	.874 (.829, .908)
First instruction about how to use a condom	13.226	1.840	.882 (.836, .916)
First instruction about STDs	13.071	1.808	.867 (.830, .897)
First instruction about how to say no	12.520	2.005	.888 (.856, .914)
First instruction about abstinence	12.532	2.596	.900 (.845, .937)

The age at first instruction measure is an estimate based on adding five to reported grade at first instruction. The National Survey of Family Growth does not specify the meaning of sex in their question about whether instruction was received before or after sex. In contrast, the age at first sex measure is specifically for first vaginal intercourse. I use whether an adolescent reported learning about a topic before or after first sex as the response variable for the logistic regression models.

Table 8 shows the average age at first sex and at first instruction on each topic for the entire sample. It also shows the proportion of respondents who reported learning about the topic before first sex among sexually active respondents who ever received instruction on that topic. Table 9 shows a multiple linear regression model of age at first intercourse according to all demographic traits of interest. Being Hispanic or other/multiple race, living in a rural area, living with someone other than both biological or adoptive parents, and not completing school are all associated with lower age at first sex. Being in the highest income quartile was associated with older age at first sex. Table 10 shows multiple logistic regression models to predict age at first instruction on safe sex topics using all explanatory variables. Table 11 shows multiple logistic regression models to predict age at first instruction on abstinence topics. Respondents who have dropped out have significantly lower ages at first instruction for all topics except abstinence.

Table 9: Linear regression predicting age at first sex

	Age at first sex	
	β	SE
Gender		
Female	.135	(.117)
Male *(ref)*		
Race		
Hispanic	−.329	(.178)
Black	−.344	(.193)
Other race	−.442	(.236)
White *(ref)*		
Income quartile		
2nd income quartile	.105	(.182)
3rd income quartile	.109	(.240)
4th income quartile	.415*	(.182)
1st income quartile *(ref)*		
Religion raised		
Protestant	−.081	(.176)
Other religion	.816	(.479)
No religion	−.127	(.195)
Catholic *(ref)*		
Metropolitan status		
Suburban	.009	(.160)
Rural	−.378*	(.184)
Urban *(ref)*		
Living situation at age 14		
Mother and stepfather	−.717*	(.293)
Other living situation	−.757***	(.151)
Both parents *(ref)*		
Nativity status		
Born outside US	.227	(.212)
Born in US *(ref)*		
Mother's education		
Completed high school	−.044	(.248)
Some college	.118	(.236)
Bachelor's degree or higher	.288	(.219)
Less than high school *(ref)*		
School completion status		
Dropped out	−.990***	(.213)
Finished or currently in school *(ref)*		
Constant	16.854***	(.338)

Notes: $*p < 0.05$; $**p < 0.01$; $***p < 0.001$

This could be because respondents are more likely to remember their most recent instruction, and those who drop out may not have received instruction recently. Non-Christian respondents report significantly older ages at first instruction for all topics except where to obtain birth control.

Table 10: Linear regression models predicting age at first instruction for safe sex topics

	Methods of birth control		Where to get birth control		How to use a condom		STDs	
	β	SE	β	SE	β	SE	β	SE
Gender								
Female	−.025	(.170)	−.063	(.146)	−.024	(.168)	.087	(.130)
Male (ref)								
Race								
Hispanic	.253	(.201)	.332	(.254)	.196	(.226)	.273	(.191)
Black	.229	(.227)	.050	(.197)	.180	(.244)	.079	(.168)
Other race	−.222	(.238)	.230	(.259)	.073	(.295)	.163	(.208)
White (ref)								
Income quartile								
2nd income quartile	−.021	(.229)	.025	(.237)	−.024	(.228)	.140	(.185)
3rd income quartile	.127	(.238)	.109	(.230)	−.174	(.240)	.007	(.188)
4th income quartile	−.118	(.254)	.056	(.274)	−.130	(.257)	.032	(.196)
1st income quartile (ref)								
Religion raised								
Protestant	.146	(.162)	−.077	(.181)	−.147	(.170)	.012	(.182)
Other religion	.642*	(.273)	.397	(.239)	.740*	(.344)	.624**	(.227)
No religion	.324	(.264)	.095	(.277)	.053	(.223)	.037	(.202)
Catholic (ref)								
Metropolitan status								
Suburban	−.120	(.172)	−.127	(.179)	.029	(.203)	−.171	(.159)
Rural	−.160	(.257)	−.662*	(.262)	−.102	(.272)	−.338	(.195)
Urban (ref)								
Living situation at age 14								
Mother and stepfather	−.182	(.216)	−.281	(.210)	−.096	(.240)	−.232	(.174)
Other living situation	.235	(.143)	.100	(.151)	.014	(.147)	.126	(.130)
Both parents (ref)								
Nativity status								
Born outside US	−.039	(.253)	−.217	(.218)	−.361	(.277)	.161	(.190)
Born in US (ref)								
Mother's education								
Completed high school	.456*	(.171)	.658**	(.206)	.338	(.240)	.191	(.186)
Some college	−.222	(.206)	.421	(.243)	.275	(.234)	−.210	(.167)
Bachelor's degree or higher	−.005	(.210)	.464*	(.226)	.335	(.236)	.039	(.183)
Less than high school (ref)								
School completion status								
Dropped out	−1.083***	(.175)	−.823**	(.299)	−.821***	(.181)	−.715***	(.166)
Finished or currently in school (ref)								
Constant	12.959***	(.357)	13.132***	(.415)	13.114***	(.400)	12.981***	(.297)

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table 11: Linear regression models predicting age at first instruction for abstinence topics

	How to say no		Abstinence	
	β	SE	β	SE
Gender				
Female	.118	(.133)	.002	(.213)
Male *(ref)*				
Race				
Hispanic	.255	(.202)	.353	(.204)
Black	.155	(.215)	.199	(.296)
Other race	.267	(.282)	.764	(.471)
White *(ref)*				
Income quartile				
2nd income quartile	−.162	(.193)	.117	(.378)
3rd income quartile	−.054	(.255)	−.451	(.318)
4th income quartile	−.193	(.234)	−.646	(.339)
1st income quartile *(ref)*				
Religion raised				
Protestant	−.085	(.187)	−.069	(.282)
Other religion	.438*	(.212)	−.745*	(.302)
No religion	.406	(.271)	.233	(.325)
Catholic *(ref)*				
Metropolitan status				
Suburban	−.087	(.160)	−.271	(.234)
Rural	−.193	(.200)	−.450	(.327)
Urban *(ref)*				
Living situation at age 14				
Mother and stepfather	−.264	(.253)	−.656	(.358)
Other living situation	.030	(.145)	−.173	(.246)
Both parents *(ref)*				
Nativity status				
Born outside US	−.130	(.267)	−.072	(.351)
Born in US *(ref)*				
Mother's education				
Completed high school	.455*	(.213)	.270	(.382)
Some college	.135	(.189)	−.464	(.350)
Bachelor's degree or higher	.156	(.251)	−.403	(.329)
Less than high school *(ref)*				
School completion status				
Dropped out	−.481*	(.213)	−.280	(.558)
Finished or currently in school *(ref)*				
Constant	12.350***	(.374)	13.196***	(.459)

Notes: $^*p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

Birth control

Table 12 shows the results of single regression models predicting reporting receiving instruction on safe sex topics before first sex. Tables A.4, A.6, and A.7 in the appendix show the single regression models after controlling for age at first sex, the multiple regression models, and the multiple regression models after controlling for age at first sex. Those born outside the U.S.

Table 12: Univariate logistic regression predicting receipt of education about sexual health topics before first sex

	Methods of birth control		Where to get birth control		How to use a condom		STDs	
	β	SE	β	SE	β	SE	β	SE
Gender								
Female	−.864*	(.371)	−1.357***	(.379)	−.899*	(.437)	−1.800***	(.356)
Constant (Male)	2.227***	(.182)	2.174***	(.202)	2.091***	(.192)	2.125***	(.137)
Race								
Hispanic	−.468	(.360)	−.798	(.472)	−.809	(.475)	−.631	(.402)
Black	−.466	(.428)	−.890	(.490)	−1.190*	(.501)	−.429	(.357)
Other	−.120	(.506)	−.129	(.678)	1.120	(.721)	.533	(.576)
Constant (White)	2.339***	(.276)	2.355***	(.335)	2.485***	(.301)	2.095***	(.278)
Income quartile								
2nd income quartile	−.417	(.441)	.414	(.537)	.331	(.521)	.669	(.404)
3rd income quartile	−.432	(.521)	.471	(.513)	−.321	(.475)	.074	(.429)
4th income quartile	−.199	(.480)	.902	(.574)	.427	(.579)	.838	(.485)
Constant	2.403***	(.354)	1.516***	(.395)	1.921***	(.386)	1.529***	(.311)
Religion raised								
Protestant	.330	(.334)	.272	(.415)	.215	(.344)	.267	(.329)
Other religion	.834	(.619)	1.726	(1.070)	1.018	(.624)	.571	(.654)
No religion	−.489	(.616)	−.440	(.660)	.115	(.518)	.026	(.490)
Constant (Catholic)	2.004***	(.274)	1.808***	(.310)	1.863***	(.270)	1.713***	(.223)
Metropolitan status								
Suburban	.387	(.304)	.084	(.436)	.206	(.409)	.207	(.280)
Rural	.632	(.419)	.303	(.506)	.457	(.475)	−.460	(.493)
Constant (Urban)	1.884***	(.235)	1.856***	(.323)	1.847***	(.300)	1.866***	(.205)
Living situation at age 14								
Mother and stepfather	−.352	(.485)	.245	(.571)	.019	(.617)	−.437	(.454)
Other living situation	−1.040**	(.360)	−.651	(.447)	−.621	(.421)	−.942**	(.343)
Constant (Both parents)	2.530***	(.270)	2.112***	(.258)	2.196***	(.282)	2.233***	(.243)
Nativity status								
Born outside US	1.204**	(.440)	−.002	(.669)	−.064	(.617)	−.085	(.473)
Constant (Born in US)	2.038***	(.167)	1.935***	(.199)	2.016***	(.199)	1.888***	(.164)
Mother's education								
Completed high school	1.204**	(.440)	−.002	(.669)	−.064	(.617)	−.085	(.473)
Some college	2.038***	(.167)	1.935***	(.199)	2.016***	(.199)	1.888***	(.164)
School completion status								
Dropped out	−.692	(.361)	−1.301*	(.528)	−1.145*	(.521)	−1.054*	(.436)
Constant (Finished or currently in school)	2.227***	(.189)	2.179***	(.204)	2.241***	(.226)	2.076***	(.193)
Observations	597		451		589		791	

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

were significantly more likely to report learning about methods of birth control before first sex, even after controlling for age at first sex. In the multiple regression model not controlling for age at first sex, those in a rural area were marginally more likely to report learning about birth control before first sex (p = .066), despite having slightly younger estimated average age at first sex. In the multiple regression model controlling for age at first sex, rural respondents' greater

likelihood of reporting learning about birth control before first sex reaches the .05 significance level level. Metropolitan status was not significant in the single regression models. Those whose mothers completed college were significantly more likely to report learning how to obtain birth control before first sex in the single regression models, but not in the multiple regression models. This difference disappeared after controlling for age at first sex.

Females were significantly less likely to learn about birth control before first sex, even after controlling for age at first sex. Those living somewhere other than with two parents at age 14 were significantly less likely to report learning about methods of birth control before first sex, though this difference disappeared after controlling for age at first sex. Those who dropped out were significantly less likely to report learning where to obtain birth control before first sex according to the single regression models, and in the multiple regression models were significantly less likely to learn about methods of birth control or where to obtain birth control before first sex. These differences according to school completion status were not significant at the .05 level after controlling for age at first sex.

Condoms

Female respondents were significantly less likely than male respondents to report learning about how to use a condom before first sex, though this effect was not statistically significant after controlling for age at first sex. Black respondents were significantly less likely than white respondents to report learning how to use a condom before first sex, even though they were significantly more likely to report learning how to use a condom at all. After controlling for age at first sex, black respondents were still somewhat less likely to report learning how to use a

49

condom before first sex (p = .07). In the multiple regression model, this reached the .05 significance threshold. This discrepancy by race indicates that although black adolescents are more likely to learn about condoms than white respondents, they are not receiving that instruction when they need it.

STDs

Females were significantly less likely than males to learn about STDs before first sex, in both the single and multiple regression models, regardless of whether age at first sex was controlled for. Those living somewhere other than with two parents at age 14 were significantly less likely to report learning about STDs before first sex. After controlling for age at first sex, there was no significant difference by family intactness.

How to say no

Table 13 shows single linear regression models predicting receipt of instruction about abstinence topics before first sex. Tables A.5, A.8, and A.9 in the appendix show single regression models after controlling for age at first sex, multiple regression models, and multiple regression models after controlling for age at first sex. Females were less likely to report learning how to say no before first sex, in both single and multiple regression models, regardless of whether age at first sex was controlled for. Respondents living somewhere other than with two parents at age 14 were significantly less likely to report learning how to say no to sex before first sex. These differences disappeared after controlling for age at first sex. In the multiple regression

Table 13: Univariate logistic regression predicting receipt
of education about abstinence topics before first sex

	How to say no		Abstinence until marriage	
	β	SE	β	SE
Gender				
Female	−1.980***	(.453)	−2.249***	(.603)
Constant (Male)	2.296***	(.156)	2.596***	(.233)
Race				
Hispanic	−.420	(.391)	−.476	(.634)
Black	−.740	(.443)	−.637	(.565)
Other	.205	(.669)	−.876	(1.001)
Constant (White)	2.316***	(.228)	2.534***	(.389)
Income quartile				
2nd income quartile	−.175	(.453)	.912	(.479)
3rd income quartile	−.301	(.478)	.253	(.682)
4th income quartile	.415	(.528)	1.451	(.755)
Constant	2.097***	(.337)	1.654**	(.512)
Religion raised				
Protestant	.756	(.415)	−.938	(.597)
Other religion	−.101	(.639)	−1.008	(.706)
No religion	−.252	(.483)	−.822	(.777)
Constant (Catholic)	1.772***	(.299)	2.911***	(.449)
Metropolitan status				
Suburban	.356	(.282)	.164	(.527)
Rural	.226	(.478)	−.389	(.731)
Constant (Urban)	1.873***	(.162)	2.199***	(.413)
Living situation at age 14				
Mother and stepfather	−.156	(.585)	−.607	(.485)
Other living situation	−.784*	(.307)	−.845	(.571)
Constant (Both parents)	2.300***	(.216)	2.511***	(.379)
Nativity status				
Born outside of US	.792	(.511)	−.273	(.792)
Constant (Born in US)	1.991***	(.150)	2.243***	(.282)
Mother's education				
Completed high school	−.588	(.444)	−.242	(.881)
Some college	.759	(.499)	.473	(.777)
Bachelor's degree or higher	.243	(.450)	.065	(.847)
Constant (Less than high school)	2.083***	(.380)	2.148**	(.685)
School completion status				
Dropped out	−.424	(.363)	−.695	(.688)
Constant (Finished or currently in school)	2.132***	(.172)	2.324***	(.285)
Observations	630		517	

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

models, Protestants were significantly more likely than Catholics to report learning how to say

no to sex before first sex. This was true regardless of whether age at first sex was controlled for.

Abstinence

Females were significantly less likely than males to report learning abstinence before first sex, in both the single and multiple regression models. Hispanic respondents were significantly less likely than white respondents to report learning about abstinence before first sex, but only in the multiple regression models. This was true even after controlling for age at first sex.

Female respondents were significantly less likely to report receiving instruction on any of the topics before first instruction. After controlling for age at first sex, female respondents were still significantly less likely to report learning how to say no, where to get birth control, STDs, or abstinence after first sex. These differences in reporting instruction before first sex occurred despite similar ages at first sex and at first instruction. For example, among sexually experienced respondents who reported receiving instruction on abstinence until marriage, the mean age at first intercourse was 16.66 for males and 16.68 for females. The mean age at first instruction about abstinence was 12.33 for males and 12.57 for females. 93.1% of males report receiving instruction on abstinence before first sex, compared to only 58.6% of females. It is possible that part of this difference is because the meaning of sex was not specified in the question about whether instruction was before or after first sex. It seems more likely that this discrepancy is because there is greater social desirability bias for women to report receiving instruction after deciding to have sex. Claiming ignorance before sex might be a way for females to externalize the responsibility for not saying no to sex, because their desires have never been legitimized in formal channels like school. Thus, this result may support Fine's (1988) idea that female desire is silenced in formal sex education.

Like in the models predicting receipt of education abou topics, dropping out was associated with decreased probability of learning about a topic before first sex. This again reinforces the need for better educational programs for adolescents who are not in school.

Difference between abstinence and how to say no to sex

Earlier research used responses to the question about "how to say no to sex" as a measure of abstinence (Donaldson et al. 2013; Kohler et al. 2008; Lindberg and Maddow-Zimet 2012). Since saying no to sex and abstinence until marriage may have different connotations, the difference between groups receiving education in these topics merits a more detailed investigation. Table 14 is a contingency table showing the proportions of respondents who learned how to say no to sex and who learned abstinence. It shows that 10.2% of respondents learned about abstinence without learning how to say no to sex, and that 23.8% of respondents learned how to say no to sex without learning about abstinence. 54% of respondents learned both, and 12% learned neither. These differences illustrate that learning how to say no to sex and learning abstinence are not the same. This implies that previous research which used learning how to say no to sex to define recipients of abstinence education overestimated those who learned about abstinence until marriage. Understanding the demographic differences between the respondents in these four categories may help illuminate some of the patterns in what messages adolescents receive about sex through formal channels.

Table 14: Proportion of respondents who reported learning abstinence topics

	Total	Did not learn to say no	Learned to say no
Abstinence			
Learned in school	.341	.032	.309
Learned somewhere other than school	.301	.070	.231
Total who learned abstinence	.642	.102	.540
Did not learn abstinence	.358	.120	.238

In order to understand who learns how to say no to sex and who learns abstinence until marriage, I fit a multinomial logistic regression model comparing those who learned neither abstinence nor how to say no to sex with those who learned about one topic without the other or those who learned about both topics (Table 15). I used all explanatory variables and data from all respondents ages 18–24.

Whether a respondent dropped out is the most consistent and most highly significant predictor of which group a respondent would fall into. Those who dropped out were less likely to learn how to say no to sex, or both abstinence and how to say no to sex. They were not significantly less likely to learn abstinence alone.

Female respondents were significantly more likely than male respondents to learn both topics than to learn neither topic. They were not significantly more likely to learn how to say no to sex alone, and only marginally more likely to learn about abstinence without how to say no to sex (p = .107). This finding is consistent with feminist perspectives which criticize sex education for placing women in the central role as responsible for abstinence and most likely to be negatively affected by premarital sex (Fields 2008; Fine 1988; Kendall 2013).

Compared to those who were taught neither abstinence nor how to say no to sex, wealthier respondents were significantly more likely to learn how to say no to sex without

Table 15: Multinomial logistic regression model predicting combination of abstinence topics received

	Neither topic	How to say no Not abstinence		Abstinence Not how to say no		Both topics	
	(reference)	β	SE	β	SE	β	SE
Gender							
Female		.131	(.204)	.473	(.288)	.509**	(.180)
Male *(ref)*							
Race							
Hispanic		.073	(.334)	−.401	(.427)	.147	(.284)
Black		−.024	(.304)	−.773*	(.351)	.112	(.267)
Other		−.859*	(.374)	−1.032*	(.467)	−.258	(.336)
White *(ref)*							
Income							
Poverty percentile		.002*	(.001)	.001	(.001)	.002	(.001)
Religion							
Protestant		.090	(.291)	.450	(.363)	.506	(.266)
Other religion		.433	(.467)	.311	(.683)	.717	(.506)
No religion		.284	(.297)	−1.180*	(.479)	−.189	(.310)
Catholic *(ref)*							
Metropolitan status							
Suburban		.063	(.226)	−.382	(.293)	−.072	(.192)
Rural		−.150	(.382)	−.367	(.383)	−.023	(.297)
Urban *(ref)*							
Living situation at age 14							
With mother and stepfather		.206	(.394)	.465	(.541)	−.171	(.335)
Other living situation		−.171	(.221)	.087	(.353)	−.468*	(.214)
Both parents *(ref)*							
Nativity status							
Born outside US		−.277	(.372)	.544	(.433)	.189	(.361)
Born in US *(ref)*							
Mother's education							
Completed high school		−.908**	(.299)	−.618	(.397)	−.630*	(.298)
Some college		−.825*	(.313)	−.617	(.419)	−.430	(.272)
Bachelor's degree or higher		−1.156**	(.344)	−.343	(.376)	−.761*	(.316)
Less than high school *(ref)*							
School completion status							
Dropped out		−.814**	(.284)	−.319	(.440)	−.748*	(.286)
Finished or currently in school *(ref)*							
Constant		1.090**	(.371)	.187	(.593)	1.433**	(.388)

Notes: In the multinomial model, respondent's percentile of poverty level is treated as a numeric variable.
*p < 0.05; **p < 0.01; ***p < 0.001

learning abstinence. They were not more likely to learn abstinence alone, and were marginally more likely to learn both abstinence and how to say no (p = .054). This may indicate that the wealthiest adolescents are not receiving the same moralistic and religious messages as their low-income counterparts. If they are learning about abstinence, they may also be learning about how to also say no to sex, which is a message that gives more agency.

By race, other/multiple race respondents were less likely to learn either topic alone compared to white respondents. Black respondents were significantly less likely to learn abstinence without learning how to say no. Those with no religion were significantly less likely to learn abstinence without how to say no than Catholics. Those not living with two parents at age 14 were significantly less likely to learn both topics.

Higher maternal education levels were associated with decreased likelihood of learning to say no to sex without learning abstinence, and somewhat decreased likelihood of learning both how to say no and abstinence. Additionally, I fit a multinomial regression model considering only maternal education, which showed that finishing high school or college was associated with decreased likelihood of learning to say no without learning abstinence ($p = .007$ for finishing high school, $p = .093$ for some college, and $p = .038$ for finishing college). Thus, this relationship between maternal education and decreased likelihood of learning how to say no without abstinence is not due to confounding variables in the multiple predictors model. This finding is surprising because maternal education is an indicator of socioeconomic status. In the case of income, greater socioeconomic status is associated with increased likelihood of learn sex education topics. In contrast, those whose mothers have higher education levels are less likely to learn how to say no to sex. This counterintuitive association between maternal education and receipt of formal sex education is a potential area for future research.

Limitations

This analysis has a few important limitations. First, although a respondent reports receiving instruction on a topic, we do not know whether the information provided was useful or

accurate. The Centers for Disease Control and Prevention (2016) estimate that only 73% of school districts have a policy with specific time requirements for health education. Since many sex education programs contain misinformation or strong moral undertones (Kendall 2013; Santelli et al. 2017), the fact that an adolescent received education in a topic may not be meaningful for their health or well-being. Abstinence education in particular may teach safe sex practices while emphasizing their ineffectiveness, which may discourage adolescents from using those practices. One study found that 27% of secondary school teachers responsible for teaching sex education emphasized the ineffectiveness of methods of preventing pregnancy and STDs (Landry et al. 2003). Furthermore, the fact that a program addresses skills or specific topics such as where to obtain birth control and how to use a condom does not mean it contains information about the relational aspects of sexuality about which students report wanting to learn (Allen 2005; Fisher 2009; García 2009; Lamb and Randazzo 2016; Sears 1992).

A second limitation of this data is recall bias. Since this sample consists of respondents ages 18–24, who are asked about sex education received before they were 18, and the mean age at first instruction for all topics was between 12 and 14, respondents are likely to forget what they learned and when. Additionally, when asked about something from their teenage years, respondents may be susceptible to the availability heuristic which causes people to remember only the events which come most readily to mind. Additionally, respondents who experience negative sexual health outcomes or unwanted pregnancy might be less likely to report having learned preventative measures.

There is likely a large social desirability bias for some answers. This is indicated by the fact that although mean age at first sex and mean age at instruction for topics for males and

females are the same, females are much more likely to say they learned a topic after they first had sex. Other studies have shown that self-reported sexual behavior among adolescents varies from biological markers of sexual behavior (Brown et al. 2012; DiClemente et al. 2011; Rose et al. 2009).

The data and methodology of this analysis presents additional limitations. Given the limited number of observations for each subgroup and the consequently high standard errors, it is difficult to detect all patterns or to hypothesize about causal pathways. Since many categorizations refer to a diverse group of people, such as the other/multiple race group and the non-Christian religious group, it is especially difficult to infer why some patterns exist. The public data from the National Survey of Family Growth does not contain any data about region, which earlier studies indicate is an important factor in rates of sex education instruction (Landry et al. 2003, 1999). My methods may present type I errors, meaning errors in which a result is statistically significant but the true relationship is not. Due to the high number of hypothesis tests, statistically significant results may be due purely to chance.

Future research

The quality of sex education needs to be better understood. Some analyses of sex education programs have been conducted (Lin and Santelli 2008; Trudell and Whatley 1991; Waxman 2004). In general, sex education is still a challenging issue for researchers to study due to its controversial nature (Kendall 2013). There is a need for a greater understanding of what happens within classrooms as well as what curricula are used. Ethnographic research has shown that the reason why some groups receive sex education may be due complex factors such as

teachers' beliefs or community controversy (Fields 2008; Kendall 2013). In order to thoroughly understand access to sex education, these factors must be better researched.

Another important area for research is adolescents' other sources of information about sexuality, such as parents and the internet. As adolescents have greater access internet sources, they may receive more information and misinformation which may affect their behavior and health outcomes (Bleakley, Hennessy, and Fishbein 2010; Eversole et al. 2017). Other research indicates differences by demographic in parental communication about sexual health information (Donaldson et al. 2013; Espinoza 2019; Lindberg et al. 2016).

Behavioral outcomes of education in these topics is also a relevant issue to address. Research indicates that in recent years, rates of teen pregnancy have been decreasing in the United States (Romero et al. 2016). While this does not invalidate the need for sex education, it is important to understand what is driving this trend.

Conclusion

According to these estimates, a substantial proportion of adolescents do not learn about specific sexual health topics such as how to use a condom or where to obtain birth control from formal sources before the age of 18. Average age at first sex varies by demographic category, and the same timing of instruction is disproportionately impactful for those who become sexually active sooner. My analysis complicates the recent research on abstinence education by examining the differences between groups who learn about waiting until marriage and about how to say no to sex.

Sociologists often discuss how education, particularly sex education, can perpetuate social inequality (Connell and Elliott 2009; Fields 2008; Fine and McClelland 2006). One of the most straightforward mechanisms by which sex education perpetuates social inequality is by being unavailable to some groups of people. I show that the receipt of instruction for many sex education topics differs significantly by gender, income, and school completion status. Wealthier people and male respondents seem to have received more progressive messages about deciding whether to have sex and how to use protection, while females and low-income adolescents learned more about abstinence. Those who dropped out of school were less likely to learn about about almost all topics.

My findings therefore support theoretical claims that sex education may serve to reinforce social inequality, since sex education is more available to males, wealthier adolescents, and those who complete school. However, it was not uniformly true that systematically oppressed groups received less comprehensive sex education. For example, black adolescents were significantly more likely to report learning how to use a condom. The lack of consistency

across the country and within smaller regions makes the question of who receives sex education particularly complicated. This research is important because lack of access to sex education can have lasting outcomes, health-related and otherwise.

Most of the research around sex education and the data available is framed in terms of adolescent health outcomes, which are uncontroversial. However, there is more to adolescent well-being than physical health outcomes. Accurate sexual health information without moral condemnation is necessary for the overall well-being of adolescents. Adolescents need better sex education which provides them with practical information and less stigmatizing, more empowering messages.

Appendix: Tables

Table A.1: Multivariable logistic regression models predicting receipt of education about birth control

	Methods of birth control		Birth control in school		Where to get birth control	
	β	SE	β	SE	β	SE
Gender						
Female	.117	(.144)	−.078	(.146)	.136	(.124)
Male (ref)						
Race						
Hispanic	−.185	(.184)	−.285	(.197)	.112	(.167)
Black	−.337	(.195)	−.404	(.200)	−.023	(.182)
Other race	−.344	(.271)	−.727**	(.254)	−.256	(.247)
White (ref)						
Income quartile						
2nd income quartile	−.235	(.219)	−.168	(.226)	−.188	(.179)
3rd income quartile	−.100	(.198)	−.079	(.205)	−.007	(.177)
4th income quartile	.194	(.230)	.212	(.237)	.103	(.169)
1st income quartile (ref)						
Religion raised						
Protestant	−.334	(.176)	−.447*	(.165)	.128	(.152)
Other religion	−.562*	(.267)	−.498	(.261)	−.345	(.233)
No religion	−.232	(.320)	−.249	(.302)	.179	(.195)
Catholic (ref)						
Metropolitan status						
Suburban	−.226	(.167)	−.092	(.171)	−.401*	(.148)
Rural	−.402	(.283)	−.446	(.284)	−.320	(.237)
Urban (ref)						
Living situation at age 14						
Mother and stepfather	−.083	(.283)	−.020	(.293)	−.279	(.236)
Other living situation	.103	(.153)	.107	(.152)	.019	(.099)
Both parents (ref)						
Nativity status						
Born outside US	−.138	(.226)	.017	(.212)	.095	(.237)
Born in US (ref)						
Mothers education						
Completed high school	.079	(.211)	.013	(.220)	.318	(.192)
Some college	−.225	(.212)	−.113	(.205)	−.186	(.240)
Bachelor's degree or higher	−.118	(.241)	−.036	(.235)	−.195	(.241)
Less than high school (ref)						
School completion status						
Dropped out	−.906***	(.220)	−.873***	(.214)	−.572**	(.183)
Finished or currently in school (ref)						
Constant	1.556***	(.331)	1.448***	(.332)	.341	(.269)

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table A.2: Multivariable logistic regression models predicting receipt of education about condoms and STDs

	How to use a condom		STDs	
	β	SE	β	SE
Gender				
Female	−.385**	(.138)	−.308	(.265)
Male *(ref)*				
Race				
Hispanic	.108	(.178)	.346	(.241)
Black	.575**	(.170)	.478	(.295)
Other race	−.091	(.254)	.242	(.388)
White *(ref)*				
Income quartile				
2nd income quartile	.136	(.182)	−.215	(.333)
3rd income quartile	−.053	(.214)	−.199	(.282)
4th income quartile	.108	(.237)	.865*	(.379)
1st income quartile *(ref)*				
Religion raised				
Protestant	−.251	(.183)	−.532	(.327)
Other religion	−.608	(.360)	−.694	(.443)
No religion	.033	(.272)	−.479	(.441)
Catholic *(ref)*				
Metropolitan status				
Suburban	−.001	(.167)	−.187	(.269)
Rural	.213	(.268)	−.245	(.399)
Urban *(ref)*				
Living situation at age 14				
Mother and stepfather	−.219	(.242)	.422	(.522)
Other living situation	.019	(.178)	.486	(.269)
Both parents *(ref)*				
Nativity status				
Born outside US	.070	(.209)	−.521	(.351)
Born in US *(ref)*				
Mother's education				
Completed high school	.008	(.182)	.507	(.336)
Some college	−.135	(.188)	.186	(.330)
Bachelor's degree or higher	−.410	(.230)	.162	(.380)
Less than high school *(ref)*				
School completion status				
Dropped out	−.409*	(.196)	−.987***	(.266)
Finished or currently in school *(ref)*				
Constant	1.053**	(.335)	2.671***	(.408)

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table A.3: Multivariable logistic regression models predicting receipt of education about abstinence

	How to say no		Abstinence until marriage		Abstinence in school		Abstinence only	
	β	SE	β	SE	β	SE	β	SE
Gender								
Female	.173	(.174)	.439**	(.148)	.205	(.118)	.377*	(.183)
Male (ref)								
Race								
Hispanic	.331	(.223)	.029	(.220)	−.172	(.238)	−.408	(.286)
Black	.396	(.245)	−.011	(.166)	.169	(.138)	−.729**	(.216)
Other race	−.020	(.274)	.141	(.233)	.074	(.239)	−.553	(.286)
White (ref)								
Income quartile								
2nd income quartile	.108	(.212)	.414*	(.194)	−.179	(.202)	.361	(.268)
3rd income quartile	.081	(.216)	.071	(.198)	−.136	(.188)	.196	(.216)
4th income quartile	.736**	(.261)	.273	(.223)	.192	(.172)	.228	(.224)
1st income quartile (ref)								
Religion raised								
Protestant	.207	(.199)	.474*	(.174)	−.206	(.212)	.398	(.255)
Other religion	.504	(.300)	.387	(.415)	−.432	(.253)	.992*	(.371)
No religion	.368	(.225)	−.524*	(.225)	.024	(.244)	−.328	(.292)
Catholic (ref)								
Metropolitan status								
Suburban	.143	(.159)	−.180	(.152)	−.029	(.152)	−.044	(.200)
Rural	.110	(.230)	.017	(.293)	−.213	(.234)	.233	(.300)
Urban (ref)								
Living situation at age 14								
Mother and stepfather	−.231	(.300)	−.177	(.274)	.074	(.227)	.323	(.283)
Other living situation	−.397*	(.174)	−.271	(.182)	−.243	(.167)	−.343	(.220)
Both parents (ref)								
Nativity status								
Born outside US	−.221	(.277)	.395	(.234)	.164	(.233)	.251	(.279)
Born in US (ref)								
Mother's education								
Completed high school	−.442	(.277)	−.052	(.215)	−.151	(.206)	−.423	(.280)
Some college	−.266	(.252)	.068	(.236)	−.150	(.221)	.039	(.319)
Bachelor's degree or higher	−.750*	(.288)	.022	(.192)	−.158	(.248)	.316	(.288)
Less than high school (ref)								
School completion status								
Dropped out	−.646*	(.256)	−.155	(.233)	−.368	(.213)	.397	(.306)
Finished or currently in school (ref)								
Constant	1.251***	(.322)	.116	(.268)	−.336	(.347)	−2.252***	(.436)

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table A.4: Single regression models predicting receipt of education about safe sex topics before first sex controlling for age at first sex

	Methods of birth control		Where to get birth control		How to use a condom		STDs	
	β	SE	β	SE	β	SE	β	SE
Gender								
Age	.503***	(.091)	.264*	(.116)	.407***	(.091)	.547***	(.092)
Female	−.463	(.408)	−1.174**	(.379)	−.569	(.406)	−1.449***	(.336)
Constant (Male)	−5.726***	(1.330)	−2.057	(1.780)	−4.320**	(1.396)	−6.424***	(1.362)
Race								
Age	.507***	(.089)	.262*	(.120)	.377***	(.098)	.554***	(.104)
Hispanic	−.065	(.397)	−.622	(.516)	−.566	(.505)	−.242	(.443)
Black	−.293	(.461)	−.798	(.481)	−.944	(.518)	.004	(.374)
Other	−.110	(.505)	−.087	(.711)	1.110	(.743)	.444	(.608)
Constant (White)	−5.773***	(1.346)	−1.904	(2.025)	−3.563*	(1.613)	−6.723***	(1.712)
Income quartile								
Age	.538***	(.086)	.267*	(.117)	.410***	(.101)	.557***	(.098)
2nd income quartile	−.637	(.423)	.367	(.593)	.310	(.597)	.647	(.474)
3rd income quartile	−.587	(.520)	.448	(.542)	−.257	(.558)	.129	(.497)
4th income quartile	−.820	(.483)	.666	(.631)	.073	(.677)	.445	(.531)
Constant	−5.790***	(1.409)	−2.672	(1.687)	−4.424**	(1.348)	−7.072***	(1.454)
Religion raised								
Age	.521***	(.094)	.290*	(.115)	.415***	(.097)	.568***	(.099)
Protestant	.308	(.367)	.223	(.412)	.187	(.371)	.304	(.350)
Other religion	.598	(.601)	1.518	(1.103)	.983	(.628)	.147	(.746)
No religion	−.573	(.657)	−.537	(.681)	−.009	(.499)	−.098	(.504)
Constant (Catholic)	−6.152***	(1.471)	−2.769	(1.871)	−4.612**	(1.559)	−7.120***	(1.553)
Metropolitan status								
Age	.502***	(.091)	.282**	(.106)	.410***	(.091)	.568***	(.096)
Suburban	.284	(.349)	.015	(.420)	.108	(.415)	.027	(.294)
Rural	.576	(.382)	.274	(.489)	.330	(.477)	−.553	(.515)
Constant (Urban)	−5.960***	(1.324)	−2.613	(1.736)	−4.511**	(1.451)	−6.887***	(1.437)
Living situation at age 14								
Age	.501***	(.092)	.283**	(.102)	.407***	(.093)	.549***	(.093)
Mother and stepfather	.190	(.612)	.527	(.626)	.219	(.720)	−.070	(.561)
Other living situation	−.708	(.397)	−.479	(.430)	−.337	(.454)	−.501	(.356)
Constant (Both parents)	−5.517***	(1.353)	−2.481	(1.517)	−4.296**	(1.448)	−6.517***	(1.413)
Nativity status								
Age	.505***	(.089)	.285**	(.103)	.419***	(.084)	.570***	(.088)
Born outside US	1.184*	(.445)	−.073	(.655)	−.246	(.637)	−.285	(.504)
Constant (Born in US)	−5.904***	(1.320)	−2.594	(1.688)	−4.518**	(1.363)	−6.972***	(1.401)
Mother's education								
Age	.517***	(.091)	.260*	(.125)	.410***	(.099)	.569***	(.101)
Completed high school	−.291	(.409)	.009	(.649)	−.160	(.614)	.399	(.554)
Some college	−.427	(.619)	.035	(.609)	.488	(.600)	.611	(.518)
Bachelor's degree or higher	−.170	(.477)	1.021	(.701)	.279	(.636)	.196	(.591)
Constant (Less than high school)	−5.737***	(1.381)	−2.423	(1.703)	−4.532**	(1.301)	−7.286***	(1.487)
School completion status								
Age	.502***	(.088)	.266*	(.109)	.399***	(.096)	.555***	(.098)
Dropped out	−.338	(.339)	−1.187	(.607)	−.934	(.585)	−.829	(.475)
Constant (Finished or currently in school)	−5.713***	(1.293)	−2.090	(1.785)	−4.056*	(1.580)	−6.622***	(1.570)
Observations	597		451		589		791	

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table A.5: Univariate logistic regression predicting receipt of education about abstinence topics before first sex controlling for age at first sex

	How to say no		Abstinence	
	β	SE	β	SE
Gender				
Age	.603***	(.091)	.313**	(.111)
Female	−1.584**	(.491)	−1.958***	(.555)
Constant (Male)	−7.063***	(1.337)	−2.424	(1.601)
Race				
Age	.613***	(.088)	.351*	(.135)
Hispanic	.120	(.451)	−.129	(.764)
Black	−.197	(.439)	−.213	(.682)
Other	.262	(.777)	−.639	(.875)
Constant (White)	−7.449***	(1.373)	−3.235	(2.355)
Income quartile				
Age	.617***	(.088)	.339**	(.121)
2nd income quartile	−.316	(.490)	.822	(.533)
3rd income quartile	−.352	(.564)	.153	(.715)
4th income quartile	−.194	(.542)	1.160	(.795)
Constant	−7.258***	(1.396)	−3.629*	(1.696)
Religion raised				
Age	.670***	(.104)	.382**	(.115)
Protestant	.857	(.478)	−1.076	(.615)
Other religion	−.681	(.627)	−1.603	(.844)
No religion	−.518	(.539)	−.946	(.820)
Constant (Catholic)	−8.538***	(1.633)	−3.041	(1.791)
Metropolitan status				
Age	.617***	(.088)	.369**	(.115)
Suburban	.213	(.329)	−.034	(.524)
Rural	−.116	(.471)	−.570	(.763)
Constant (Urban)	−7.569***	(1.369)	−3.544	(1.799)
Living situation at age 14				
Age	.619***	(.091)	.337**	(.112)
Mother and stepfather	.401	(.778)	−.368	(.574)
Other living situation	−.198	(.335)	−.575	(.562)
Constant (Both parents)	−7.506***	(1.400)	−2.960	(1.743)
Nativity status				
Age	.610***	(.088)	.366***	(.103)
Born outside US	.647	(.581)	−.372	(.849)
Constant (Born in US)	−7.452***	(1.321)	−3.559*	(1.718)
Mother's education				
Age	.630***	(.097)	.364**	(.130)
Completed high school	−.813	(.503)	−.397	(.968)
Some college	.573	(.557)	.302	(.862)
Bachelor's degree or higher	−.282	(.581)	−.208	(.995)
Constant (Less than high school)	−7.414***	(1.395)	−3.476*	(1.586)
School completion status				
Age	.616***	(.089)	.355**	(.117)
Dropped out	−.034	(.384)	−.551	(.799)
Constant (Finished or currently in school)	−7.469***	(1.339)	−3.349	(1.941)
Observations	630		517	

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table A.6: Multiple logistic regression predicting receipt of education about sexual health topics before first sex

	Methods of birth control		Where to get birth control		How to use a condom		STDs	
	β	SE	β	SE	β	SE	β	SE
Gender								
Female	−.506	(.407)	−1.144**	(.373)	−.394	(.576)	−1.410***	(.342)
Male *(ref)*								
Race								
Hispanic	−.419	(.433)	−1.107	(.560)	−.779	(.602)	−.702	(.469)
Black	−.456	(.459)	−1.085	(.579)	−1.388*	(.512)	−.581	(.372)
Other race	.054	(.449)	−.286	(.703)	1.070	(.806)	.638	(.670)
White *(ref)*								
Income quartile								
2nd income quartile	−.505	(.572)	.270	(.550)	.303	(.462)	.473	(.390)
3rd income quartile	−.684	(.610)	.117	(.561)	−.578	(.454)	−.197	(.425)
4th income quartile	−.693	(.593)	.131	(.660)	−.106	(.559)	.121	(.428)
1st income quartile *(ref)*								
Religion raised								
Protestant	.403	(.413)	−.014	(.678)	.066	(.609)	.038	(.566)
Other religion	.530	(.660)	.931	(1.111)	.549	(.621)	.152	(.624)
No religion	−.355	(.631)	−.794	(.745)	−.393	(.676)	−.182	(.604)
Catholic *(ref)*								
Metropolitan status								
Suburban	.501	(.293)	−.024	(.421)	.053	(.348)	.165	(.261)
Rural	.986	(.520)	.825	(.675)	.511	(.596)	−.371	(.410)
Urban *(ref)*								
Living situation at age 14								
Mother and stepfather	−.117	(.469)	.659	(.589)	−.122	(.634)	−.406	(.427)
Other living situation	−.912*	(.382)	−.125	(.442)	−.348	(.466)	−.661	(.403)
Both parents *(ref)*								
Nativity status								
Born outside US	1.453**	(.514)	.862	(.526)	.252	(.444)	.058	(.443)
Born in US *(ref)*								
Mother's education								
Completed high school	.017	(.371)	−.314	(.463)	−.433	(.472)	.295	(.598)
Some college	−.231	(.443)	−.356	(.532)	.249	(.480)	.248	(.551)
Bachelor's degree or higher	.270	(.493)	.818	(.639)	−.105	(.557)	−.084	(.598)
Less than high school *(ref)*								
School completion status								
Dropped out	−.806*	(.395)	−1.254*	(.562)	−1.321**	(.450)	−.882	(.494)
Finished or currently in school *(ref)*								
Constant	2.631***	(.691)	2.675**	(.815)	3.084***	(.828)	2.573**	(.785)
Observations	591		444		585		782	

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table A.7: Multiple regression for reported receipt of education about safe sex before first sex controlling for age at first sex

	Methods of birth control		Where to get birth control		How to use a condom		STDs	
	β	SE	β	SE	β	SE	β	SE
Age	.511***	(.087)	.216	(.119)	.347**	(.106)	.533***	(.115)
Gender								
Female	−.267	(.406)	−1.025**	(.370)	−.236	(.491)	−1.267***	(.319)
Male *(ref)*								
Race								
Hispanic	−.131	(.452)	−.962	(.580)	−.558	(.606)	−.328	(.525)
Black	−.360	(.514)	−.988	(.583)	−1.181*	(.507)	−.294	(.362)
Other race	.214	(.450)	−.215	(.709)	1.079	(.832)	.571	(.660)
White *(ref)*								
Income quartile								
2nd income quartile	−.757	(.543)	.270	(.574)	.287	(.542)	.501	(.441)
3rd income quartile	−.825	(.595)	.170	(.576)	−.530	(.488)	−.104	(.457)
4th income quartile	−1.067	(.623)	.142	(.637)	−.270	(.617)	−.021	(.472)
1st income quartile *(ref)*								
Religion raised								
Protestant	.592	(.406)	.026	(.732)	.096	(.714)	.203	(.644)
Other religion	.341	(.521)	.788	(1.156)	.775	(.707)	−0.000	(.793)
No religion	−.303	(.687)	−.833	(.765)	−.365	(.712)	−.110	(.653)
Catholic *(ref)*								
Metropolitan status								
Suburban	.495	(.343)	−.085	(.424)	.003	(.361)	.036	(.301)
Rural	.951*	(.461)	.724	(.639)	.376	(.563)	−.396	(.443)
Urban *(ref)*								
Living situation at age 14								
Mother and stepfather	.116	(.513)	.788	(.612)	.059	(.723)	−.150	(.534)
Other living situation	−.789	(.409)	−.078	(.446)	−.169	(.446)	−.356	(.390)
Both parents *(ref)*								
Nativity status								
Born outside US	1.218*	(.526)	.627	(.482)	.003	(.464)	−.288	(.474)
Born in US *(ref)*								
Mother's education								
Completed high school	−.140	(.433)	−.383	(.503)	−.339	(.503)	.203	(.547)
Some college	−.434	(.520)	−.393	(.538)	.317	(.530)	.149	(.519)
Bachelor's degree or higher	−.022	(.551)	.696	(.651)	−.072	(.602)	−.256	(.541)
Less than high school *(ref)*								
School completion status								
Dropped out	−.598	(.365)	−1.137	(.627)	−1.086*	(.510)	−.702	(.482)
Finished or currently in school *(ref)*								
Constant	−5.288***	(1.458)	−.782	(2.167)	−2.588	(1.923)	−5.909**	(2.067)
Observations	591		444		585		782	

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

68

Table A.8: Multiple logistic regression predicting receipt of
education about abstinence topics before first sex

	How to say no		Abstinence until marriage	
	β	SE	β	SE
Gender				
Female	−1.981***	(.459)	−2.473***	(.535)
Male *(ref)*				
Race				
Hispanic	−.197	(.483)	−1.461**	(.500)
Black	−.741	(.482)	−.503	(.486)
Other race	.494	(.594)	−.612	(.504)
White *(ref)*				
Income quartile				
2nd income quartile	−.135	(.547)	.529	(.432)
3rd income quartile	−.307	(.594)	.046	(.491)
4th income quartile	.226	(.585)	.685	(.793)
1st income quartile *(ref)*				
Religion raised				
Protestant	1.151**	(.394)	−1.461	(.969)
Other religion	.145	(.474)	−1.436	(.976)
No religion	−.154	(.430)	−1.564	(1.146)
Catholic *(ref)*				
Metropolitan status				
Suburban	.413	(.297)	−.179	(.390)
Rural	.314	(.538)	−.270	(.531)
Urban *(ref)*				
Living situation at age 14				
Mother and stepfather	−.099	(.536)	−.509	(.405)
Other living situation	−.421	(.397)	−.912	(.457)
Both parents *(ref)*				
Nativity status				
Born outside US	.783	(.635)	−1.028	(.755)
Born in US *(ref)*				
Mother's education				
Completed high school	−.730	(.555)	−1.181	(.806)
Some college	.432	(.563)	−.283	(.677)
Bachelor's degree or higher	−.080	(.585)	−1.207	(.752)
Less than high school *(ref)*				
School completion status				
Dropped out	−.373	(.395)	−1.132*	(.527)
Finished or currently in school *(ref)*				
Constant	2.094*	(.785)	5.675***	(1.229)
Observations	625		512	

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table A.9: Multiple regression for reported receipt of education about abstinence topics before first sex controlling for age at first sex

	How to say no		Abstinence	
	β	SE	β	SE
Age	.655***	(.113)	.314***	(.086)
Gender				
Female	−1.591**	(.474)	−2.204***	(.492)
Male *(ref)*				
Race				
Hispanic	.326	(.508)	−1.201*	(.505)
Black	−.295	(.496)	−.202	(.494)
Other race	.583	(.689)	−.338	(.462)
White *(ref)*				
Income quartile				
2nd income quartile	−.330	(.551)	.526	(.455)
3rd income quartile	−.282	(.607)	.122	(.505)
4th income quartile	−.020	(.630)	.628	(.817)
1st income quartile *(ref)*				
Religion raised				
Protestant	1.490**	(.484)	−1.582	(1.068)
Other religion	−.062	(.613)	−1.889	(1.109)
No religion	−.098	(.526)	−1.591	(1.250)
Catholic *(ref)*				
Metropolitan status				
Suburban	.326	(.374)	−.385	(.403)
Rural	.061	(.597)	−.437	(.527)
Urban *(ref)*				
Living situation at age 14				
Mother and stepfather	.408	(.723)	−.525	(.408)
Other living situation	−.060	(.368)	−.662	(.440)
Both parents *(ref)*				
Nativity status				
Born outside US	.438	(.641)	−1.196	(.793)
Born in US *(ref)*				
Mother's education				
Completed high school	−.854	(.606)	−1.051	(.770)
Some college	.231	(.634)	−.134	(.691)
Bachelor's degree or higher	−.149	(.662)	−.918	(.712)
Less than high school *(ref)*				
School completion status				
Dropped out	−.071	(.386)	−.905	(.556)
Finished or currently in school *(ref)*				
Constant	−8.299***	(1.965)	.492	(1.824)
Observations	625		512	

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

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